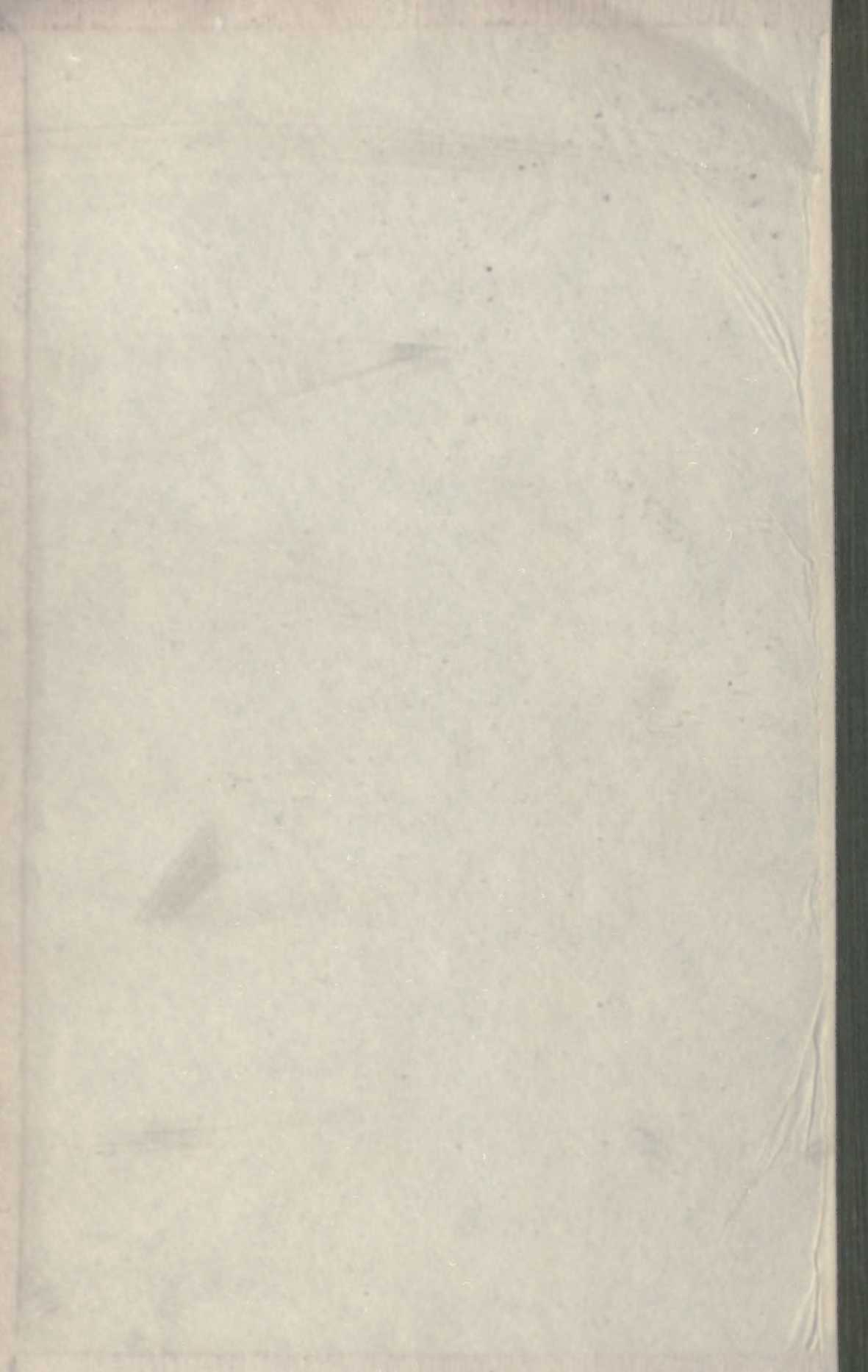


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INDEX OF SUBJECT MATTER

COLLECTIVE REVIEWS

Bone Grafting	Clarence A. McWilliams, M.D., F.A.C.S., New York	1
Tumors of the Mouth	Vilray Papin Blais, A.M., M.D., F.A.C.S., St. Louis	117
Uterine Hemorrhage	Palmer Findley, M.D., F.A.C.S., Omaha	133
The Significance of Bacteruria	L. L. Ten Broeck, M.D., Minneapolis, Minn.	149
Gunshot Wounds in the Present War	Colonel Louis A. LaGarde, Medical Corps, U.S.A. (Retired)	465
The Relation of the Ductless Glands to Blood-Pressure in Surgery	J. E. Sweet, A.M., M.D., F.A.C.S., Philadelphia	591

ABSTRACTS OF CURRENT LITERATURE

- ABDERHALDEN'S** dialysis, 70, 71
 Abderhalden reaction, Specificity of, 70, 278
 Abderhalden serum test, Results of applying a quantitative method to, for cancer, 72
 Abderhalden Test, 190
 Abdominal, Technique of, caesarean section, 60; Surgical tuberculosis of, cavity, 372; Operation for cure of hernia between, recti, 376; support of corset for women, 420; Common, crises, 396; Gunshot wounds of, cavity, 397; Enormous, cyst probably due to a retained testis, 650
 Abdominal surgery, Relation of pelvic to, 305; Use of free omental grafts in, 489; Relation of obstetrics, gynecology and, to public welfare, 342; Local anesthesia in, 590
 Abdominal wounds, Operative treatment of, in war, 76; Why, how, and where to intervene in, 397; Penetrating, with multiple perforations of small intestine, 602
 Abdominoperineal excision of rectum, 495
 Abdomen, Injuries of, 55; Penetrating wounds of, treated at front, 76; Gunshot injuries of, 155; Operative treatment of gunshot injuries of, 252, 253, 288; Gunshot wounds of, in field, 372; Treatment of gunshot injuries of, 373; Acute typhoid, with surgical complications, 486; Operative treatment of penetrating wounds of, 507
 Abortive treatment of infection in wounds, 74
 Abortion, Criminal, 90; Causes and treatment, 308
 Abscess, Late, after gunshot injury of brain, 53; Treatment of brain, 247; Subperiosteal, of maxillary sinus, 193; Empyema and pulmonary, 249; Lung, and bronchiectasis from surgical point of view, 251; Perinephritic, 310, 649; Blind dental, 311; Subdiaphragmatic, 377; of liver, 384; Fecal, in pouch of Douglas following typhoid, 416; Treatment of peritonissar, by tonsillectomy during acute stage of disease, 448; Periprostatic, of tuberculous origin, 347
 Acetone and diazotic, Elimination of, acid in surgical cases, 377
 Acidosis, Phenomenon of, and its influence in surgery, 69
 Acoustic nerve, Removal of tumors of, through labyrinth, 216
 Actinomycosis, Treatment of, with roentgen rays, 280
 Active substance contained in placenta and corpus luteum, 450
 Adenitis, Tonsils and chronic cervical, 217; Facial tonsil as portal of entry in tuberculous cervical, 448
 Adenoma of prostate, 96; Fibros, of ciliary body, 315
 Adhesions, Peritoneal, and their relation to intestinal stasis, 376; Treatment of pelvic, 533
 Adnexa, Operative treatment of diseases of, and relation to peritonitis, 393
 After-treatment, of mastoid wound, 102; Amputations and, 397; of suppurative appendicitis, 605
 Albee operation, Dangers of, in Potts' disease in children, 615
 Albumin, Diagnostic value of, in stomach contents, 254
 Alimentary canal, Early treatment of gunshot wounds of, 486
 Alimentary tract, Fluoroscopic screen and radiography plate in diagnosis of medical and surgical lesions of, 284
 Alveolar infections, Deep-seated, 664
 Amnesia, Morphine and scopolamine, in obstetrics, 92, 93
 Amebiasis, Relation of, to pyorrhea alveolaris, 663
 Amputate, When, where, and how to, in treatment of gas bacillus infection, 396
 Amputated, Changes in stumps of bones, 272
 Amputations, Conservation of tissue and function in, 182; Abdominal skin-flap in radical, of breast, 308; High, of rectum, 364; and after-treatment, 397; Functional value of stump after, 397; Ten rules for, of the lower limbs, 397; Secondary plastic operations on, stumps, 398; Radical, of breast under local anesthesia, 395; Protheses in, of the arm, 610; Note on thigh, 610
 Anemia, Splenectomy in chronic, 387; Splenectomy for Von Jackson's, 398
 Anemic, Occurrence of bodies resembling "Schäfflin bodies" in, and fetal blood, 539
 Anesthesia, General, Intratracheal ether, in surgery of brain and spinal cord, 31; Morphine as aid to, 31; Method for production of general anesthesia and, 142; Practical experience with narco, 246; with ethyl chloride in military surgery, 105; in labor, 310; in bicus surgery, 367; in surgical dissection, 367; Regional and, 389
 Anesthesia, Local, 147; Removal of bullet from right ventricle of heart under, 154; in surgery of lower bowel, 169; in herniotomy, 171; Nephrectomy under, 322;

- spinal, with sternal, 476. Caudal, in genito-urinary surgery, 111; in excision and amputation of the eyelid with sarcoma, 124. Experiments with, 390; in abdominal surgery, 390. Prolapsed ethyl chloride, during extensive dressings, 490. Operations by, on external genitalia and prostate, 643.
- Anesthesia, Preventing injurious action of, on central nervous system, 11. Choice and technique of, 141. Local, 414. Inhibition of toxicity of ammonium nitrate by sodium carbonate and protection of kidney acutely nephropathic from uraemia from toxic action of an, by sodium carbonate, 648.
- Analgosis, Nitrous oxide, in obstetrics, 63, 64. Method for production of general and anaesthesia, 141. Study of, produced by opium alkaloids, 471.
- Anastomosis, New method for facilitating intestinal, 118, 122. Uretero-artery, 111. Blood vessel, with use of cannula forceps, 402. New method for facilitating, 403.
- Anatomical development, Errors in, cause and surgical significance, 111.
- Anatomy, Surgical, of capsule of facial tonsil, 118.
- Anastomosis, Treatment of, 71, 178, 184, 181. Treatment of traumatic, resulting from bullet wounds, 188. Occlusion in treatment of, 110. War, 194. Dangers of gangrene after operation for, 179. Traumatic, of external iliac artery, 404.
- Anginal crisis, Peritonitis following acute ovaritis of, 612.
- Arthroplasty, Roentgenotherapy for, 69.
- Arthrodesis, Dislocation of elbow-joint flexed, of knee-joint, 203. Resection of elbow for, from war injuries, 194.
- Arkylation of spine, 184.
- Arm, Prevention of fatula in, 169.
- Animals, Persistent developmental, of position of large intestine, 104.
- Anomaly, Recto-urethral, 117.
- Anomalous clinics and pre-maternity practice at Edinburgh Royal Maternity Hospital, 644.
- Antiseptics, Urinary, 441.
- Antiseptic substances, Use of, in treatment of infected wounds, 74. Re-establishment of, 167. Action of certain, on pus, 188.
- Antitoxins, Intravenous treatment of tetanus with large doses of, 59. Prophylaxis in traumatic tetanus, 189. Content of serum of tetanus patients, 181.
- Anterior, diaphragm, Abdo to, 110.
- Anuria in patient on whom left nephrectomy had been done, 419.
- Aortitis, Syphilitic, and its serology, 110.
- Apoplexy, Rational methods of dealing with spontaneous haemorrhage, 164; of the internal ear, 117.
- Apparatus, Closed ether, 147. Extension, with passive and automatic movements, 171.
- Appendages, Tuberculosis of uterine, 101.
- Appendicitis, 167. Left-sided, 108. Left-sided, complicating transposition of viscera, 104; as sequela of tonsillitis, 108. Drainage in peritonitis after, 108. Diagnosis of, in early typhoid fever, 100. Spontaneous and experimental, ulcer of stomach and cholecystitis, 100. Ovary, vermiform in etiology of, 103. Usual case of, 103. After-treatment of suppurative, 101. Three hundred twenty-four cases of, operated upon without a death, 101. During pregnancy, 147.
- Appendicectomy, 414.
- Appendix, 181. Cystoma of, 10. Diseases of extraperitoneal, vermiform, 10. Biology of vermiform, 101. Pseudomucous cysts of, and ruptured pseudomucous cysts, 117. Surgery of, 100.
- Arm, Splint for compound fractures, of 101. Prosthesis amputations of, 610.
- Artery, Traumatic aneurism of external iliac, 104.
- Arthritis, Treatment of, 111. Originating about teeth, 171. Pneumococcal, 170. Nose, throat, and anatomy shown in etiology of chronic infection, 110. Chronic, treated with radio-active mineral water, 171. Experimental, in rabbit, 400. Treatment of Tuberculosis, 400. Chronic prostatitis and spermatozoositis and their relationship to, 611.
- Arthropathies, Lactic, 167.
- Arthroplasty of elbow, 181.
- Arthroscopy, Congenital dislocation of hip reduced by manipulation followed by, 171.
- Artificial pneumothorax, 149.
- Artificial vagina, Construction of, with establishment of menstrual function, 104.
- Ascites, Operative treatment of, in cirrhosis of liver, 104.
- Asphyxia, Presentation of practical helps in prevention and treatment of, neonatorum, 100. Resuscitation by means of preserved living erythrocytes in experimental illuminating pus, 110.
- Asphyxiating war gases, Effects of, 411.
- Aspiratory puncture, Treatment of acute epididymitis by, 119.
- Astragalus, Fracture of, 104.
- Auditory meatus, Total occlusion of right external, 116.
- Aural discharge, Operative interference of, 111.
- Aural operation, Curettage of Eustachian tube in, 111.
- Autograft, Clinical status of, 175.
- Autolysis, treatment for cancer, 175. Action of, on mouse tumors, 111.
- Autoplastic, repair of recent fractures, 61. repair of fractures of neck of femur, 180. Bone transplantation, 103.
- Autotransfusion of blood in extra uterine pregnancy and rupture of uterus, 411.
- Axis, Non-fatal fracture of, 111.
- B**ACKACHE, Gynecological aspects of, 105, in genito-urinary disease, 111.
- Bacteremia, Placental, 115.
- Bactericide, Urea as, 403.
- Bacteriology, of cholecystitis, 161. of septic wounds, 180.
- Baker's method, Extracapsular pneumolysis and using by, 111.
- Bandages, Coagulum, 188.
- Bant's symptom-complex with relation to splenectomy, 171.
- Basedow's or Graves' disease, Treatment of exophthalmic goiter, 103.
- Benign growths, Primary, of stomach, 100.
- Bile-duct poisoning, Decapsulation of kidney in, 102.
- Bile-duct, Reconstruction of common, 60. Implantation of, into upper jejunum, 407.
- Bile-passage, Restoration of, after serious injury to common or hepatic duct, 100.
- Biliary obstruction, Diagnosis of, by calculus, 184.
- Biliary tract, Surgical treatment of, 164. Perforation of, 185.
- Biological explanation of X-radiation effects, 100.
- Biology of peripheral nerves in transplantation, 185, 114.
- of vermiform appendix, 103.
- Birth mortality, presentation of practical helps in prevention and treatment of asphyxia neonatorum, 100.
- Bladder, Prostate of, and uterus, 10, 111. Transposition of, and uterus for cure of cystitis and obstructions about, 111. Clinical thermometer in, 111. Foreign bodies in urinary, 111, 110. Gunshot injuries of, 111. Shrapnel bullet in, 100. Operative treatment of tumors of, 100. tumors in young, 111. Horma of, 114. Carcinoma of, 111. Limitations of high-frequency treatment of papilloma of, 111. Endrophy of, 100.
- Bladder, See also Urinary

- Bleeder, Excessive, 449
 Bleeding, Diagnosis of intracranial, in newborn, 341
 Blindness, Sudden, due to suppuration of accessory nasal sinuses, 443
 Blood-cell changes in gastric cancer, 233
 Blood diseases, Ligation of splenic vessels as substitute for splenectomy in, 607
 Blood-platelet extract, physiological hemostatic in nose and throat surgery, 431
 Blood pressure during pregnancy, 314
 Blood-transfusion, Citrate method of, in children, 403
 Blood-vessel, Facilitating the connection of, 731; Affections of, which may become surgical, 270; suture, 2701
 anastomosis with use of cannula forceps, 405
 Blood-vessel: See also Aneurism
 Blood, Sarda's test for, in urine, 98; Sodium citrate method of indirect transfusion of, 200; Transfusion of, with reference to use of anticoagulants, 602; Changes in, caused by radiotherapy, 284; Injury with extravasation of, in pericardium, 481; Occurrence of bodies resembling "Seldin bodies" in anemic and fatal, 530
 Bony conformations, Congenital fracture of clavicle with other fault, 179
 Bone graft, 305; for tuberculosis of spine, 66; Fate of, 507
 Bone marrow, Transplantation of, 272
 Bone plating problem, 507
 Bone regeneration, 264
 Bone transplants, Fate of free, 63; in Pott's disease, 510
 Bone and joint, Limitation of X-ray diagnosis of, diseases 179; Radiotherapy of, tuberculosis, 264; Treatment of, tuberculosis, 265; tuberculosis, 389; Gunshot injuries of, 406; Treatment of infected gunshot injuries of, 504; Immobilization in treatment of gunshot wounds of, 504
 Bone, Pseudofracture of sesamoid, of big toe, 63; Injuries to, at tendon and ligament insertions without local tenderness, 173; Changes in stumps of amputated, 272, dystrophies simulating tumors of bone, 388; Gunshot lesions of diaphyses of long, 390; Autoplastic, transplantation, 395; Potential factors in fracture surgery of shafts of long, 502
 Borderline between operative and non-operative treatment in gynecology and obstetrics, 640
 Bowel, Local anesthesia in surgery of lower, 169
 Brace, Treatment of rigid rotary lateral curvature of spine by, 66
 Brachial plexus, Osteoplastic approach to, below clavicle, 274
 Brachialis, Neurolysis of plexus, 185
 Brain, Late abscess after gunshot injury of, 53; Open and closed treatment of gunshot wounds of, 247; Plastic closure of dura with fascia in gunshot wounds of, 247; Plastic covering of defects of dura after excision of, prolapse, 33; Intratracheal ether anesthesia in surgery of, and spinal cord, 51; Treatment of, abscess, 247; infection of otic origin, 330; Anesthesia in, surgery, 262; Diagnosis of, tumor, 502; and sinus complications of otitis media, 556
 Branchiogenic carcinoma, 151
 Breast, Plan for reduction of death rate from cancer of, 24; Elastic mobility of, in retromammary cyst, 132; Roentgenotherapy in post-operative treatment of carcinoma of, 248; Senile parenchymatous hypertrophy of, 368; Abdominal skin-flap in radical amputation of, 368; Cancer of, 594; Radical amputation of, under local anesthesia, 505
 Breech anterior, Double nuchal displacement of arms in a footling presentation with, chin caught above symphysis pubis, 340
 Breech presentations, Delay in, from extension of legs, 641
 Bronchiectasis, Lung abscess and, from surgical point of view, 311
 Bullet wounds, English, action of regular infantry bullet and dum-dum bullet, 271; Disabilities caused by, 407
 Bursitis, Operative treatment of, by Mayo method, 282
 Bursitis, Subdeltoid, 208
C
 CACHEXIA of hypophyseal origin, 392
 Cesarean section, Technique of abdominal, 90; Improvements in technique of, 309; Extraperitoneal, 307; Symphysiotomy or, 424; Indications for, 416; Newer methods of, 237; Uteroparietal fistula consecutive to, 528; Third consecutive, upon same woman, 128; done for fourth time upon same woman, 538
 Calculi, Formation of urinary, 120; Diagnosis of, ureteral, 517; Ureteral, symptoms and treatment, 518; Urinary, 519; Vesical, in children, 350; Pyelolithotomy in renal, 431
 Calculus, Errors in diagnosis of renal and ureteral, 317; Diagnosis of biliary obstruction by, 384; Treatment of vesical, 434; Prostatic, 436
 Callus formation, Treatment of delayed, and pseudarthrosis with fibrin injection, 358
 Cancer of breast, Education can increase number of cures, 394; Reduction of death rate from, 34
 Cancer of cervix, Radium therapy of, 298; Radical operation for, 635
 Cancer of mouth, successfully treated with radium, 102; Treatment of, and tongue, 561
 Cancer of stomach, Relation between gastric ulcer and, 162; Roentgen diagnosis of, 253; Blood-cell changes in, 255; Early recognition of, 600
 Cancer of uterus, High vs. low degrees of heat as palliative treatment for advanced cases of, 201; Radium therapy in treatment of, 201; Mesothorium treatment in, 412; Relative merits of operations for, 439
 Cancer, Results of applying a quantitative method to Abderhalden serum test for, 72; of prostate, 96; Paradox in, 186; Treatment of skin and mucous membrane, 186; mortality, 187; Antolysis treatment for, 273; Cause and cure of, in recent radiobiological research, 283; Action of radium on, of pelvic organs, 300; Treatment of intrinsic, of larynx by thyrocricotomy or thyrotomy, 430; Surgeon's education in, 514; Theory of, etiology, 515; Use of steam in treatment of superficial, 516; of penis, 546; Primary and intrinsic, of duodenum, 602; Treatment of, 618; Mortality from, in Western Hemisphere, 618
 Cancer: See also Carcinoma
 Cannula forceps, Blood-vessel anastomosis with use of, 405
 Capsule of faucial tonsil, Surgical anatomy of, 218
 Carbohydrate tolerance in hyperthyroidism, 302
 Carcinoma of cervix, Value of combination method in treatment of, 300; Heat in treatment of, 511
 Carcinoma of uterus, Radiotherapy of, and breast, 202; Treatment of, with roentgen rays, 413; High degrees of heat vs. low degrees of heat as treatment for advanced cases of, 530; Heat in treatment of, 530; Value of heat in treatment of massive and utterly inoperable, 636
 Carcinoma, of appendix, 30; Branchiogenic, 151; Etiology and prophylaxis of, 487; Roentgenotherapy in post-operative treatment of, of breast, 424; of small intestine, 237; of bladder, 433; of jaw, 473; Transplantable, of guinea pig, 602; Cause of, 610; of uterus, 649

- Carcinoma, Prevention of injurious by-effects in treatment of deep-seated, with radium and roentgenium, 177; Radium in treatment of, of cervix uteri and vagina, 208
- Carcinoma, Simulation of esophageal stenosis by extensile, of lesser curvature of stomach, 428
- Cardiac dilatation, Right-sided hypertension with, as post-operative complication, 70
- Case of the month, 544
- Carcinoid, Permanent partial compression of both common, in epilepsy, 54
- Cavitary body, Tumors of, 366
- Cartilaginous transplants, Reparation of loss of skull substance of base by, 302
- Cartilage, Transplantation of, in reparative surgery, 121
- Cataract, Congenital coralliform, 101; Conjunctival flaps in operations, 511; Management of eyelids during operation, 511
- Catgut suture, Improved substitute for indolized, 473
- Catgut, Preparation of, 388
- Catheter, Diagnosis of ureteral calculi, use of wax-tipped, in male, 117; Use of diasternal, in diagnosis, 600
- Caudectomy, 473
- Caudofur, Recovery after operation for, tumor, 151
- Cerebellum, Differential diagnosis of lesions of labyrinth and, 120
- Cerebrospinal, Treatment of, meningitis, 525; Nature and quantitative determination of refluxing substance in normal and pathologic, fluid, 479; Drainage of, fluid as factor in treatment of nervous syphilis, 112
- Cervical, Unilateral rotary displacement of, spine, 184; Value of combination method in treatment of, carcinoma, 300; myoma, 300; Radical operation for, cancer, 633
- Cervix, Chatter of, uteri, 208; Radium in treatment of carcinoma of, uteri and vagina, 208; Radium therapy of cancer of, 208; Heat in treatment of carcinoma of, 203
- Chance of cervix uteri, 208
- Chemotherapeutic experiments on rat tumors, 626
- Chest, How to accurately localize foreign bodies in, and method of removal, 120; Penetrating wounds, 288; Gunshot wounds of, in present war, 204; Injuries of, 205; complications among wounded, 108; Surgery of, cavity, 481
- Childbirth, Method to lessen perineal and vaginal tears during, 91; Reappearance of menstruation after, 211; Early rising after, 407
- Children, Transient hematuria in, 430
- Chloroform in treatment of wounds of mouth and jaws, 477
- Cholecystectomy, 384; and cholelithiasis, 120
- Cholelithiasis, 600; Pathogenesis of spontaneous and experimental appendicitis, ulcer of stomach, and, 260; Bacteriology of, 364
- Cholelithiasis, See also Biliary tract
- Chondriolism, Treatment of, 407
- Chorioepithelioma, Malignant, from sacrococcygeal region, 309
- Chorioepithelioma after last preceding pregnancy, 409
- Choroid, Post-operative detachment of, with Elliot's operation for glaucoma, 123
- Circulation and restoration of function of injured nerves, 400
- Ciliary body, Fibrosarcoma of, 317
- Circulation, Effect of sternal binder on, 73
- Cirrhosis of liver, Operative treatment of ascites in, 504
- Citrate method of blood transfusion in children, 201; Transfusion by, in sixty-hour-old baby with melena neonatorum, 201
- Clavicle, Congenital fracture of, with faulty bony union, 170; Osteoplastic approach to brachial plexus before, 274; Complete dislocation of extremity of, 369
- Clubfoot, Treatment of congenital, 84; Operation for relapsed, 103
- Club and flat-foot, Method of bandaging in, 611
- Coagulants, Transfusion of blood with special reference to use of, 611
- Coagulum bandages, 308
- Cocaine, Upper respiratory passages in habitual users of, and homicide, 108
- Collar fracture, treatment and results, 301
- Coliculus, Seminal, 611
- Colon and caecum, Persistent developmental anomalies of position of large intestine with reference to ascending, 604
- Complement-deviation test as guide in infections of urethra, prostate, and vesicle, 91
- Complement-fixation, in diagnosis with bacterial extracts prepared with digestive fermenta, 203; Gonococcus, a new lipid antigen, 611
- Complications, Some, in connection with acute otitis media, 109; Intracranial of chronic suppurative otitis media, 111; Management of pneumothorax occurring as of nephrectomy, 411; Chest, among wounded, 208; Infections, of war injuries, 203; Relation of morphine to post-operative, and immunity, 474
- Compression, Permanent partial, of both common carotids in epilepsy, 54
- Congenital, Treatment of, clubfoot, 84; malformations of cornea, 101; coralliform cataract, 100; intestinal anomalies, 101; Repeated invaginations of small intestine, absence of right half of large intestine, 600; perineal testicle, 311; Structural changes in, hip dislocation, 303; Late deformities in reduced, hips and osteochondritis deformans juvenilis, 611; Can speech present a sign of, syphilis, 151; deformities of vestibule and ribs, 310; Torticollis, 502; lumbar or costovertebral hernia, 308; defect of femur, 611; occlusion of posterior nares, 610
- Conjunctival flaps in cataract operations, 511
- Conjunctiva, Technique of covering wounds of cornea with, 514
- Conservation, of tissue and function in amputations, 182; Operative, of ovary, 300
- Constitutional symptoms, Cause and prevention of, following deep roentgenotherapy, 280
- Contracted pelvis and difficult labor, 91
- Contraction ring dystocia, 200
- Cordage tube, Efficiency of, and rationale of radiotherapy in treatment of malignant tumors, 75
- Cord, Division of right anterolateral tract of, for relief of pain in tabetic crises, 110
- Cornea, Congenital malformations of, 101; Technique of covering wounds of, with conjunctiva, 514
- Corpus luteum, Active substance contained in placenta and, 410; of pregnancy as it is in value, 111; Use of, extract in treatment of menstrual disorders, 204; extract in nausea of pregnancy, 645
- Corset, Abdominal support of, 120
- Coxa valga, Study of, 408, 608
- Coxa juvenilis, Osteochondritis deformans, 611
- Cranial, Diagnosis of tumors in posterior, fossa, 120; Factors that make better results in, surgery, 364; Restoration of loss of substance by insertion of osteoplastic flap cut from external table of skull in skull, 301
- Creatine and creatinin excretion during puerperium and their relation to involution of uterus, 413

Cetismism, Control of experimental, 564
 Criminal abortion, 502
 Crises, Common abdominal, 596
 Curettement, of Eustachian tube in aural suppuration, 331; Uterine, 447
 Curvature of spine, Treatment of rigid rotary lateral, by brace, 56
 Cutaneous neoplasms, Anatomic distribution of, 313
 Cysts, kidney, 400; Origin of retroperitoneal, tumors, 597
 Cystitis and cystin stones, 545
 Cystitis, Proliferating intercalous, 336
 Cystoscope, Kidney lesions diagnosed with aid of, and X-ray, 432
 Cystoscopic examinations during pregnancy, 422
 Cysts, Elastic mobility of levum in retromammary, 152; Pseudomucinous, of appendix and ruptured pseudomucinous ovarian, 167; Dermoid, free in abdomen during pregnancy, 309; of prostate, 478; Enormous abdominal, probably due to retained testis, 630
D
 DACRYOCYSTITIS, Embedding the nasal canal in treatment of, 533
 Dakin's fluid, Pyoculture and, 605
 Death, Plea for reduction of, rate from cancer of breast, 541; Signs and symptoms of impending, 519; Liability for, of hospital patient claiming to have drunk mercuric chloride solution, 654
 Decapsulation of kidney in bichloride poisoning, 312
 Defects, Covering in skull, 53
 Deflected nasal septa, Treatment of, 560
 Deflected septum as causal factor in sinus diseases, 559
 Deformities, Plastic operations for, of face, 149; Flexion, of knee, 505; of foot, 508; Congenital, of vertebrae and ribs, 510; Inversion of ilium and sacrum and ischium and pubes as causes of, of female pelvis, 541; Late, in reduced congenital hips and osteochondritis deformans juvenilis, 611
 Delbet's solution, Treatment of wounds with, 382
 Delivery, Abnormal, from defective development of uterus, 509; Causes influencing presentation at, 426
 Dental, Blind, abscess, 333; path, importance as an avenue of infection, 663
 Dermatoses, Precancerous, 401
 Dermoid cyst free in abdomen during pregnancy, 309
 Desmoid tumor, Congenital, of rectus sheath in infant, 561
 Development, Errors in anatomical, cause and surgical significance, 521
 Devices, Improvised, for war surgery, 392
 Diabetes, Glycosuria and, in surgical diseases, 276
 Diabetic coma, Soft eyeball in, 554
 Diabetic gangrene, Treatment of, with hot air, 501
 Diacetic acid, Elimination of acetone and, in surgical cases, 377
 Diagnosis, Renal pain, and clinical significance, 332; Clinical, of gastric ulcers, 378; Complement-fixation in, with bacterial extracts prepared with digestive ferments, 403; and treatment of enlarged prostate, 437; Wrong, 633
 Dialysis, Abderhalden's, 70, 71
 Diaphragmatic hernia, Non-strangulated, due to indirect injury, 484
 Diaphragm, Hemothorax and adhesions of, in penetrating injuries of thorax, 153
 Diaphyses, Gunshot lesions of, of long bones, 390
 Diet and tumor growth, 402
 Dietl's crisis in right kidney associated with left pelvic kidney, 420
 Digestive canal, Occult hemorrhage of, 500

Disabilities caused by bullets, shrapnel, high explosives, 407
 Dislocation, Early, of war injuries, 79; of septic joints, 590; and immediate or early removal of recent wounds, 388
 Dislocation, Congenital, of right foot with complete absence of right fibula, 63; Volar, of semilunar bone with fracture spine of os trapezium, 431; of hip-joint, 182; Anteversion of neck of femur in congenital, of hip, 560; Congenital, of hip reduced by manipulation followed by arthrodesis, 211; Structural changes in congenital hip, 303; Complete, of extremity of clavicle, 569; of elbow-joint, 507; Fracture, of cervical vertebrae, 590; Reducing, of shoulder, 272; of semilunar bone, 503; of knee, 504
 Displacement of uterus, 111, 636; Surgical treatment of anterior, accompanied by irritation of bladder, 502; Mechanical aids to, 636
 Displacement, Unilateral rotary, of cervical spine, 184; of lens, 444; Double nuchal, of arms in floating presentation with breech anterior, chin caught above symphysis pubis, 520
 Drainage, of stomach by gastrostomy, 561; of peritoneal cavity, 576; Abuses and dangers of, tubes, 473; of cerebrospinal fluid in treatment of nervous syphilis, 510; Pilliform, 588
 Drug addiction, Considerations of, in surgical cases, 518
 Duodenal catheter, Use of, in diagnosis, 600
 Duodenal feeding, 600
 Duodenal ulcers, Essential factors in diagnosis of chronic gastric and, 158; Gastric and, 256; Perforation of gastric and, 370; Study of gastric and, 500; Ulcers new and old; jejunal or, 601
 Duodenum, Roentgen observation of gall-bladder and hepatic ducts after perforation into, 562; Surgery of, 490; Primary and intrinsic cancer of, 602
 Dura, Plastic covering of defects of, after excision of brain prolapse, 53
 Dysmenorrhea, Surgical treatment of anterior displacements of uterus accompanied by irritation of bladder, and sterility, 502; Treatment of, 638
 Dystocia, Contraction ring, 120
 Dystrophies, Bone, simulating tumors of bone, 388
E
 EAR, Influence of nasal accessory sinus disease upon, 216; Thiersch graft in operation for middle, suppuration, 331; Syringing the, 557; Apoplexy of internal, 557; Conservatism and radicalism in surgery of, nose and throat, 557; Cauliflower, 655; Chronic running, 655
 Eclampsia, Treatment of, 89, 306, 423, 641
 Ectopic gestation, Relative frequency of, 307
 Ectopic pregnancy, 422, Treatment of ruptured uterus and ruptured, 87; Inaugural symptoms of, 307
 Ectropion, 101
 Elbow, Arthroplasty of, 182; Fracture of, 501; Resection for injuries of, in war, 306
 Electrovibrator, Installation and surgical use of, 608
 Elliot's operation, Post-operative detachment of choroid with reference to, for glaucoma, 513
 Embolism, Fat, in military surgery, 194
 Emphysematous gangrene, Acute, 417
 Empyema, Pneumodynamics of, 409; Medical aspects of, and pulmonary abscess, 429; Treatment of acute, 210; Treatment of chronic, 230; Puzzling features of, 481; Parapneumonic, 483; Metapneumonic, and its treatment, 405
 Endometrium, Relation between degree of menstrual reaction in, and clinical character of menstruation, 81; Changes in, 415

- Inducement of childbirth from obstetric standpoint, 644
 Intake, Utah, anastomosis, 373
 Interoesophageal, Grafts, compared with pyloroplasty, 216
 Intestine, Local anastomosis in excision and, of
 eyeball with anastomosis, 344; Method of, 322
 Euryne theory of cancer etiology, 313
 Epilepsy, Permanent partial compression of both common
 carotids in, 32
 Epithelioma, anastomosis for sterility, 214
 Epithelioma, Treatment of acute, by auxiliary puncture,
 320; Focal inflammation of the tonsil following
 surgery, 533
 Epithelioma, 36
 Epistaxis, hernia, strangulated, 484
 Epistaxis, and transfusion in treatment of shock, 277
 Epistaxis, Primary gland contains, or compound similar to it,
 479
 Epistaxis, Separation of lower, of tibia, 393; Traumatic
 separation of superior, of tibia, 602
 Epistaxis, 444; A perineal safety measure, 97; Double
 during labor, 424
 Epithelioma, X-ray treatment of fungating, with progres-
 sive situation, 221
 Erythroblastosis, Fetal, 513
 Erythrocytes, Resuscitation by means of preserved living,
 in experimental illuminating gas asphyxia, 420
 Essential uterine hemorrhage, 303
 Esophagus, Ligation of peritoneum with, 56; Closed, apparatus,
 443
 Ether, salt, Intravenous use of, solution in tetanus, 277
 Ethyl chloride, General anesthesia with, in military sur-
 gery, 103; Prolonged, anesthesia during extensive
 dressings, 302
 Etiology and prophylaxis of carcinoma, 187
 European war, Medicomilitary aspects of, 407
 Eustachian tube, Curettage of, in aural suppuration,
 322
 Evulsion, Results of, of transverse process of fifth lumbar
 vertebra, 274
 Exophthalmos, Treatment of, 593
 Exophthalmos, Oxycephalic, with traumatic rupture of
 both eyes, 213
 Experimental, Control of, cretinism, 594
 Experimental, Chemotherapeutic, on rat tumors, 626
 Expiratory puncture, Diagnosis of intrathoracic neo-
 plasms by, 34
 Exploring needle, Extraction of, broken in attempting to
 do a spinal puncture for diagnostic purpose, 309
 Exstrophy of bladder, 520
 Extensor, apparatus with passive and automatic move-
 ments, 271; Treatment of fractures of lower limb with
 continuous, by means of Finsen's stirrup ap-
 paratus, 506
 Extraction, of projectiles from lungs, 55; of bullet from
 right lobe of heart, 526
 Extraperitoneal, Diseases of, appendix vermiformis, 59;
 carcinoma section, 307
 Extraperitoneal pneumonitis and filling by Baer's method, 231
 Extra-uterine pregnancy, Autotransfusion of blood in,
 and rupture of uterus, 492
 Extravasation of blood, Injury with, in pericardium, 463
 Eyeball, Local anesthesia in enucleation and enucleation
 of, with anastomosis, 324; Soft, in diabetic coma, 354
 Eyelids, Management of, during the cataract operation,
 613
 Eye, Use of anastomosis for detecting iron in, 213; Oxyce-
 phalic exophthalmos with traumatic rupture of both,
 213; Lesions of membranes of, in war with eyeball
 intact, 320; War injuries of, 443; Tuberculosis in
 relation to, diseases, 553; Infection in diseases of, 555
 Face, Plastic operations for deformities of, 322
 Facial paralysis, Palliative treatment of, by plating
 of soft subcutaneous parts, 544
 Fallopian tube, Polypus of, 293
 False aneurysm, Treatment of, 72
 Fascia transplantation, in treatment of old fractures of
 patella, 305; Complete excision of large band,
 anastomosis free, with debridement, 224
 Fat embolism in military surgery, 204
 Fate of our wounded in next war, 323
 Feeding, Duodenal, 600
 Feet, Painful, causes and treatment, 253
 Female pelvis, Inversion of the ilium and sacrum and is-
 chium and pubis as causes of deformities of, 343
 Femur, Treatment of fractures of, in field, 270; Autoplastic
 repair of fractures of neck of, 186; Treatment of
 compound fractures of, 269; Fracture of, 269; Nail
 extending in fracture of, 322; Anteversion of neck of,
 in connection with congenital dislocation of hip, 260;
 Traumatic sarcoma of, 269; Congenital defect of,
 511
 Ferments, Complement fixation in diagnosis with bacterial
 extracts prepared with digestive, 203
 Fibrin injection, Treatment of delayed callus formation
 and pseudarthrosis with, 355
 Fibro-adenoma of ciliary body, 215
 Fibrous uteri, Vaginal supravaginal hysterectomy for
 procidentia and large cystocele with chronic,
 415
 Fibroids, X-ray treatment of uterine, 84; Uterine, in
 production of sepsis, 84; Choice between operation
 and roentgenization of uterine, 85; of ligamentum
 ovum primum, 324
 Fibroids, See also Tumor, Myoma
 Fibula, Congenital dislocation of right foot with complete
 absence of right, 63
 Filtration, X-ray treatment of fungating epithelioma with
 progressive, 192
 Finger, Trigger, 610
 Finsen's stirrup apparatus, Treatment of fractures of
 lower limb with continuous extension by means of,
 506
 First aid, treatment of fractures, 186; in the Navy, 203
 Fistula, Prevention of, in ano, 169; Repair of small vesico-
 vaginal, 205; Post-operative ureteral, 245; Oesopha-
 gogastrochyl, 312; Uteroparietal, consecutive to crura
 rean operation, 338
 Fixation, methods in treatment of fractures of pseudar-
 throsis, 186; Technique of, dressings, 203; of uterus
 and consequences in obstetrics, 417
 Flat feet, Method of hammering in club, and, 611
 Flat-foot, 184; Bone-graft in painful, paralytic valgus
 and painful deformities of foot, 65; Treatment of
 beginning, 207; its relation to neuritis and its treat-
 ment, 208
 Flexor-Jobling, Intratesticular implantation of, rat sar-
 coma, 609
 Fluorescent screen, localization by parallax method, 260;
 and radiography plate in diagnosis of medical
 and surgical lesions of alimentary tract, 184; Extraction
 of foreign intra-ocular bodies under intermittent
 control of, 354
 Focal infections of accessory nasal sinuses, 329
 Fortal erythroblastosis, 611
 Fortis, Hydroa ulnarialis, 457
 Foot, Congenital dislocation of right, with complete ab-
 sence of right fibula, 61; Fracture of bones of, from
 marching, 205; struts and other common foot defects,
 206; Deformities of, 206; Flat, its relation to neuritis
 and treatment, 208; Dorsal tendons of, 600

- Footling presentation, Double nuchal displacement of arms in, with breech anterior, chin caught above symphysis pubis, 340
- Forceps, Use and abuse of, 312
- Foreign bodies, in respiratory tract, 331 How to accurately localize, in chest and method of removal, 332; Diagnosis and removal of, in trachea, bronchi, and esophagus, 333; Localization of, by X-rays, 333; X-ray detector for removal of, in tissues, 393; in urinary bladder, 313, 326; Extraction of, from lungs, 351; Significance of, in tissues, 314; Extraction of intra-arterial, under intermittent control of fluorescent screen, 334
- Fracture sprain, Volar dislocation of semilunar bone with, of os triquetrum, 181
- Fracture surgery, Potential factors in, of shafts of long bones, 302
- Fractures of femur, 260; Treatment of, in field, 261; Autoplastic repair of, 180; Treatment of compound, 269; Nail extension in, 302
- Fractures of patella, Operative treatment of closed, 180; Fascia transplantation in treatment of old, 300
- Fractures of skull, 301; Roentgen diagnosis of, 130; with healed attic suppurative of an unusual type, 477; Basal, 477; Analysis of 1,000, and report of 24 examined at necropsy, 478; Early double subtemporal trepanation for, 301
- Fractures, Treatment of, 62, 260, 270, 301, Autoplastic repair of recent, 62; Roentgenogram as aid in, work, 170; First-aid treatment of, 180; Fixation methods in, of pseudarthrosis, 180; End-results of bone, 181, 301; Steel-pin open method of treating, 181; Extension treatment with calipers in gunshot, 260; Operative treatment of bad results after, 270, 303; Correction of depressed, of nose by transplant of cartilage, 300; Adjustable splint for treatment of, 302; Treatment of, of lower limb with extension of Finocchetto's stirrup apparatus, 608
- Fractures, 178, 179; of sesamoid bones of thumb, 179; Colles', treatment and results, 301; of the elbow, 301; Treatment of, of humerus, 268; Splint for compound, of arm, 301; Value in diagnosis of roentgen picture of, 268; dislocations of cervical vertebrae, 300; of vertebrae without cord symptoms, 613; of bones of foot from marching, 302; Prevention of deformity following, or resection of jaw, 477; Gunshot, of extremities, 301; of astragalus, 302; Non-fatal, of axis, 311; of spine without paraplegia, 612
- Freiburg method, Nitrous-oxide analgesia in obstetrics; advantages over, 93, 94
- Freyer's operation, Sexual functions following suprapubic prostatectomy, 97
- Frontal sinus, Osteoma of, 478
- Functional, value of stump after amputations, 307; Freeing of nerves, and recuperation, 617
- Function, Renal, tests, 435; Cicatrization and restoration of, of injured nerves, 400; Unusual early re-appearance of, in resected and reunited nerves, 616
- G**ALALITH in nerve tubulization, 617
- Gall bladder, End results of operations on, 170; Roentgen observation of, and hepatic ducts after perforation to duodenum, 261; Malignant tumors of, 606
- Gall-bladder: See also Biliary, cholecystitis
- Gall-stones, Situs viscerum inversus with, 171; Recurrent, 409
- Galvanocautery loop, Suppurative inflammation of middle ear after removal of nasopharyngeal tumors with, 301
- Gangrene, of lung, 332; Dangers of, after operation for aneurism, 279; Open dry treatment of gas infection especially gas, 301; Treatment of diabetic, with hot air, 301; Acute emphysematous, 317; Value of hypochlorous acid in treatment of gas, 333
- Gas bacillus, When, where, and how to amputate; Treatment of, infection, 306; Infection, 314
- Gas gangrene, Value of hypochlorous acid in treatment of, 333
- Gas infection, Open dry treatment of, 301
- Gas phlegmons, 189; Use of oxygen in treatment of, 308, in war injuries, 334
- Gas poisoning among British troops in Flanders, 260
- Gauss, Polarizing by notches, used by enemy, 627
- Gastric and duodenal ulcers, 216, 300
- Gastric cancer, Roentgen diagnosis of, 255; Blood-cell changes in, 353
- Gastric ulcer, 161; Relation between, and cancer, 301; Diagnosis of, 378; Diagnosis of chronic, and duodenal ulcers, 168; Perforation of, 370; Surgical treatment of, 380
- Gastrocolostomy, Rovsing's operation for, 36
- Gastro-enterostomy compared with pyloroplasty, 163
- Gastro-intestinal studies, 157; Roentgen ray in, affections, 213, 254; Value of X-ray in diagnosis of, disturbances, 254; Prognosis of, wounds without operation, 483
- Gastropostomy, 489
- Gastrostomy, Drainage of stomach by, 36
- Gaucher's disease, 408
- Genitalia, Operation by local anesthesia on external, and prostate, 653
- Genito-urinary, Value of degeneration of leucocytes for quick diagnosis of, tuberculosis, 97; Roentgen examination of, tract, 441; Backache in, disease, 441; Caudal anesthesia in, surgery, 331
- Gestation, Relative frequency of ectopic, 207
- Gland, Human prostate, in youth, 96; Suprarenal, 212
- Glaucoma, Post-operative detachment of choroid with reference to Elliott's operation for, 215
- Glucose solutions as prophylactic against post-operative shock, 189
- Glycosuria, and diabetes in surgical diseases, 276; in pregnancy, 109
- Goiter, 366; Treatment of exophthalmic, 303; Analysis of one hundred and thirty-seven cases of, 303
- Gonosocis complement fixation, 613
- Gonorrheal ureteropyelitis treated by injections of anti-meningitic serum, 325
- Gonorrhea, Extent and significance of, 536; in women, 610
- Grafting, Bone, 305
- Grafts, Use of free omental, in abdominal surgery, 480; Fate of bone, 307
- Granulomata, Subcutaneous, 275
- Gravitarum, Pyonephritis, 91
- Grawitz' tumor, Ultimate result of operation for, 544
- Growth, Destruction of obstructive glandular, in posterior urethra by high-frequency current, 328
- Gunshot fractures, Extension treatment with calipers in, 260; of the extremities, 301
- Gunshot injuries, Treatment and prognosis of, of skull, 321; Late abscess after, of brain, 331; of peripheral nerves, 66, 67, 183; of bladder, 213; of spinal column and cord, 273; Pleurisy after, of thorax, 370; of lung, 371; Neuralgia after, 324; Vascular lesions produced by, 624
- Gunshot injuries of abdomen, 131; Operative treatment of, 254, 253; treated by laparotomy, 288; Treatment of, 373
- Gunshot injuries of joints, 61, 280; and bones, 266; at the front, 209; Treatment of, 300; Treatment of infected, 304
- Gunshot lesions of diaphyses of long bones, 300

- Conduit wounds. Treatment of, of head, 38, 147; Plastic closure of dura with fascia in, of head, 147; Open and closed treatment of, of head, 147; Treatment of, of abdomen in war, 188; of abdomen in field, 171; of abdominal cavity, 197; Treatment of, of small intestine, 191; of chest in present war, 194; of larynx and trachea, 190; of lungs and tuberculous, 111; Early treatment of, of urinary canal, 400; Importance of immobilization in treatment of, bones and joints, 194; of lumbar spine, 190; General treatment of infected, 190; Use of hypochlorous acid in, 190
- Cytological aspects of bacillus, 107; problems, 108
- Cystology, and pancreas, 88; Modern, 421; Relation of diabetes and abdominal surgery to public welfare, 141; Difference between operative and non-operative treatment in, and diabetes, 140
- Gynecomastia. Hyperthyroidism associated with, 480
- H**EMATURIA. Essential, 111
- Hemophilia. Metabolism studies in, 621
- Hemorrhage. Essential thromb, 104; Rational methods of dealing with spontaneous, 104; In newborn, 458; Treatment of uterine, by prostipen ray, 110; Removal of dissected femur by amputation, 161; Occult, of digestive canal, 100; Immediate treatment of severe post-partum, 143
- Hemostasis. Obliteration of lateral sinus as method of venous, in injuries of upper cervical region, 146
- Hematoma following acute indigestion occurring in infant, 106
- Hemistoma, cause and diagnosis, 116; in renal neoplasm, 410; Transient, in children, 410
- Hemorrhage. Inter, in thigh, 178; Intracranial, in newborn, 115
- Hemorrhoidal operations, 162
- Hemostatic. Blood platelet extract, physiological, in nose and throat surgery, 134
- Hemothorax and adhesions of diaphragm in penetrating injuries of thorax, 111
- Hand. Treatment of, infections from economic viewpoint, 178; Preservation of wounded, 179; Traumatic edema of, 160; and arm prostheses of maimed in war, 610
- Harelip surgery; essentials in production of scarless incision, 14
- Hindbrain. Relation of nasal disease to, 158
- Head. Common injuries, 142
- Healing. Influence of the size of defect on wound, in skin of guinea pig, 173
- Heart. Removal of bullet from right ventricle of, under local anesthesia, 114; Extraction of bullet from right lobe of, 100; Incised wound of, 100
- Hent. High vs. low degrees of, as treatment for cancer of uterus, 101; as treatment of carcinoma of uterus, 100; 111; in treatment of utterly inoperable uterine carcinoma, 101
- Heliotherapy of war injuries, 406
- Hepatic ducts. Roentgen observation of gall bladder and, after perforation into duodenum, 111; Restoration of bile passage after serious injury to common or, 406
- Hepatic torsion. Chronic intestinal stasis produced by obstruction at duodenal and, 111
- Hemodialysis. Symmetrical stenosis in, syphilis, 100
- Hemal peritonitis, 100
- Hernia. Mackenzie's operation, inguinal route for femoral, 100; Intersigmoid peritoneal, 100; Unusual contents of inguinal, 111; Operation for umbilical, 100; Operation for, between abdominal wall, 100; of bladder, 111; Intussuscepted epiploic, 101; Non strangulated diaphragmatic, due to indirect injury, 101; Congenital lumbar or costo-lumbar, 101
- Herniotomy. Local anesthesia in, 111
- Hemid. Upper respiratory passages in habitual users of cocaine and, 101
- High-frequency current. Destruction of obstructive glaucoma in posterior chamber by, 101; Laminectomy of, treatment of papilloma of bladder, 111
- Hip-disease. Quiet, 111, 100
- Hip-joint. Dislocation of, 111
- Hip. Hyperthral joint responses with reference to, stimulating fracture of neck of femur, 111; Anterior view of neck of femur in connection with congenital dislocation of, 101; Congenital dislocation of, reduced by manipulation followed by arthrotomy, 111; Structural changes in congenital dislocation, 101
- Hodgkin's disease. Primary neoplasms of lymphatic glands including, 400
- Hospital experience in Turko-Bulgarian War, 81
- Hot air. Treatment of diabetic gangrene with, 101
- Humerus. Treatment of fracture of, 101
- Hydrathion body, 80
- Hydrocele. Radical cure of, by inguinal route, 651
- Hydrops Universalis fortis, 111
- Hyperemia. Passive, in treatment of severe grenade and shrapnel injuries, 111
- Hypertension. Right-sided, with cardiac dilatation as post-operative complication, 10
- Hyperthyroidism. Attempts to produce experimentally conditions of sympathicotonia, vagotonia, and, 111; Carbohydrate tolerance in, 101
- Hyperthyroidism associated with gynecomastia, 480
- Hyperthroidism, variations in female secondary sexual characteristics and internal secretions, 111
- Hypertrophy. Indolent, of prostate, 111; Senile parathyroidism, of breast, 101
- Hypochlorous acid. Value of, in treatment of gas gangrene, 111; Use of, in gunshot wounds, 101
- Hypophyary. Cachexia of, origin, 101
- Hypoplasia. Treatment of, 111
- Hysterectomy, from viewpoint of general surgeon, 81; Vaginal supravaginal, for proclivita and large cystoectocoele with chronic fibrosis uteri, 111; Cesarean hysterectomy consecutive to cesarean operation; second cesarean, hysterectomy, 111; Cesarean operation done for fourth time upon same woman; subtotal hysterectomy, 111
- I**LEOCECAL. Chronic intestinal stasis produced by obstruction at, and hepatic flexure, 101
- Ileocecostomy. Fascial transplant method with, 101
- Iliac duplex, 100
- Iliac. Lesions of the lumbosacro, region, 101
- Immobilization. Importance of, in treatment of gunshot wounds of bones and joints, 101
- Indications for cesarean section, 401
- Indigestion. Hematomesis following acute, occurring in infant, 106
- Infantile paralysis. Orthopedic treatment of disabilities resulting from, 111; Tendon fixation in, 111, 101; Testing muscular strength in, 111; Orthopedic treatment necessary and its importance during, 111
- Infected joints. Treatment of, in field, 100
- Infected wounds. Use of antiseptic substances in treatment of, 101
- Infection. Abortive treatment of, in wounds, 101; Treatment of hand, from economic viewpoint, 178; Positive method of curing purulent, 101; Wound, and its treatment, 101; Diagnosis of chronic, of urinary tract in women, 101; Puerperal, 110, 111; Treatment of puerperal, 111, 101; Errors in diagnosis of renal, 111; Mechanics of renal, 647; When, where, and how to

- amputate; treatment of gas bacillus, 398, 399; Laboratory diagnosis of, chronic, of urinary tract in women, 110; Treatment of, of accessory sinus, 119; Dental path as important avenue of, 663; Deep-seated alveolar, 664
- Inflammation of iliac fossa following simple epididymitis, 611
- Inguinal, Moschowitz' operation, route for femoral hernia, 346; Contents of, hernia, 253; Radical cure of hydrocele by, route, 613
- Injuries action, Means of preventing, of anesthetics on central nervous system, 52
- Injuries of nerves, Gunshot, peripheral, 66, 67, 513; Treatment of, 275; from projectiles especially of the sciatic, 327; Operative treatment of, 615
- Injuries of skull, Treatment and prognosis of gunshot, 52; Non-penetrating, by bursting of shells and nervous lesions caused by them, 75; Common head injuries, 24; Surgery of penetrating, at front, 165; Unlocalized intracranial, 363
- Injuries, Common shoulder, 173; Gunshot, of bladder, 213; of abdomen, 55; Treatment of gunshot, of abdomen, 373; of spinal cord in war, 76; Early disinfection of war, 79; Obliteration of lateral sinus as method of venous haemostasis in, of upper cervical region, 246; Joint, and suppurations and their treatment, 267; of superior longitudinal sinus, 287; Treatment of, of jaw in military hospitals, 287; of kidney in war, 322; of chest, 367; Gunshot, of lung, 371; Heliotherapy of war, 406; Resection of, of elbow in war, 506; to eye resulting from accidents at polo, 553
- Internal secretion, Further investigations of origin of tumors in mice and part played by, in development of tumors, 618; Hypertrichosis variations in female secondary sexual characteristics and, 637
- Interruption, Diagnosis of complete, of great nerve-trunks of limbs, 616
- Intestinal, Congenital, anomalies, 163; Roentgen diagnosis of, perforation, 163; Roentgen ray in gastro-conditions, 233, 234; Method for facilitating, anastomosis, 358, 493; Prognosis of gastro-, wounds without operation, 485; Chronic, obstruction versus intestinal stasis, 491
- Intestinal stasis, Chronic, 164, 165, 604; Newer conceptions of, 258; Peritoneal adhesions and their relation to, 379; Study of, 382, 491; Chronic, and its associated so-called toxemia, 492; Recent research work in, 492
- Intestine, Carcinoma of small, 358; Surgery of large, 495; Repeated invagination of small, 602; Penetrating abdominal wound with multiple perforations of small, lateral laparotomy, recovery, 602; Persistent developmental anomalies of position of large, with reference to ascending colon and caecum, 604
- Intracranial, hemorrhage in newborn, 315; Unlocalized, injuries, 363; complications of chronic suppurative otitis media, 444; Diagnosis of, bleeding in newborn, 541; Extraction of, projectiles in two stages; trepanation for access after radiographic location; extraction under radioscopic screen, 591
- Intralaryngeal, intervention of, polyp, 449
- Intranasal, obstructions, 117; Progress of, surgery, 332; Reflex manifestations of, origin, 332
- Intrapartum, Abuse of pituitrin, 326
- Intrathoracic operations with aid of thoracoscope, 249
- Intraspinal treatment of tetanus with large doses of antitoxin, 69
- Intrathoracic neoplasms, Diagnosis of, by exploratory puncture, 54
- Intratracheal ether anesthesia in surgery of brain and spinal cord, 51
- Intravenous use of ether-salt solution in tetanus, 277
- Intubation, Report of forty-six cases of, 661
- Intussusception, Diagnosis of, in children under three years of age, 163; Early diagnosis of, 257; Study of, 201
- Invaginations, Repeated, of small intestine, 602
- Inversion of ilium and sacrum and lichen and pubes, 341
- Involution of uterus, Creatin and creatinin excretion during puerperium and relation to, 423
- Iodine, in combating peritonitides, 374; compounds of human thyroid, 480; Use of, in diseases of eye, 555
- Iodized catgut sutures, Improved substitute for, 424
- Iridostasis, Histological findings after, 555
- Iritis, 443; Treatment of, 554
- JAW, Sarcoma of upper, symptomatically cured by X-ray, 246; Treatment of injuries of, in military hospitals, 287; Carcinoma of, 476
- Jejunal or duodenal ulcers, 601
- Jejunum, Implantation of common bile-duct into upper, 497
- Joint, Gunshot injuries of, 61, 289; at the front, 499; Treatment of, 500; Treatment of infected, 504
- Joint tuberculosis, 389; Treatment of bone and, 265
- Joint, Hysterical, neuroses with reference to hip, 174; Limitation of X-ray diagnosis of bone and, diseases, 172; Treatment of, infections by lavage and direct medication, 174; Paralytic ankle-, 183; Mobilization of ankylosed, 266; injuries and suppurations and their treatment, 267; Dislocation of elbow-, 303; Disinfection of septic, 300; Treatment of infected, in field, 609
- Joints: See also Arthritis
- KIDNEY, Triangle of Petit in, surgery, 212; function in normal and diseased women during pregnancy and puerperium, 308; Stone in, and ureter, 310; stone, 420; Irregular, vessels, 321; Interesting, case, 321; Supernumerary, 321; Decapsulation of, in bichloride poisoning, 322; Nephrectomy under local anesthesia; adenoma of, 322; Injuries of, in war, 322; Plastic surgery in, pelvis and ureters, 323; Diet's crisis in right, associated with left pelvic kidney, 420; Cystic, 430; lesions diagnosed with aid of cystoscope and X-ray, 432; Surgical, 433; Inhibition of toxicity of uranium nitrate by sodium carbonate and protection of, acutely nephropathic from uranium from toxic action of anesthetic by sodium carbonate, 648
- Kidney: See also Renal, Vesical, Perinephritic
- Kiutsi-Malone, Experiences with, urinary test for pregnancy, 641
- Knee, Mechanical derangements of, -joint, 175; Dislocation of, 504; Flexion deformity of, 505; Static pains in, 611
- Knee-chest position as means of prevention of obstetric morbidities, 646
- LABOR, Contracted pelvis and difficult, 91; Complete intraplacental uterine rupture during, 91; Mechanism of, in spontaneous evolution, 209; Missed, 212; Anesthesia in, 312; Scopolamine-morphine, scopolamine-pantepone, and scopolamine-narcophine in, 313; Double episiotomy during, 424; Rectal as substitute for vaginal examination in, 427; Third conservative cesarean section upon same woman; operated at term in course of, 538
- Labyrinthitis, Subacute purulent otitis media, and purulent leptomeningitis due to encapsulated streptococcus, 311
- Labyrinth, Removal of tumors of acoustic nerve through, 216; Differential diagnosis of lesions of, and cerebellum, 556; Trans-, operation for tumors of acoustic nerve and pontocerebellar angle, 478
- Lacerated perineum, Improved method for repair of, 87

- Laceration, Repair of complete, of female perineum, 437
 Laceration of cervix, Intermediate trachelorrhaphy; its use as prophylactic against pernicious effects sometimes caused by, 304
 Lachrymal sac, Operation for draining, and nasal duct into anastomosis, 232
 Lame calves, Use and abuse of, 201
 Laparotomy, Local anesthetic, for multilocular ovarian cyst, 430
 Laryngoscope, Suspension, its aid in treatment of tuberculosis and epiphritic lesions of larynx, 384
 Laryngoscopy, Suspension, 440; Methods useful in direct, 436
 Larynx, Gunshot wounds of, and trachea, 370; Treatment of intrinsic cancer of, by thyrocrichotomy or thyrotomy, 430; Suspension laryngoscope as aid in treatment of tuberculosis and epiphritic lesions of, 361; The, in one hundred cases dying of pulmonary tuberculosis, 400; Fibroadipoma of, 400; Cerebral stenosis of, by intubation, 060; Fatty tumor obstructing, 064
 Lavage of peritoneum with ether, 30; Treatment of joint infections by, and direct medication, 134
 Leads, Vacuum dressing, 048
 Leged limbings, One, 318
 Legs, Displacement of, 444
 Leptostomatitis, Subacute purulent otitis media, labyrinthitis and purulent, due to capsulated streptococcus, 219
 Lesions of membranes of eye in war with eyeball intact, 310
 Leucocytes, Changes in, in malignant disease, 517
 Leucopenia, its relation to anemia, 519
 Ligament insertions, Injuries to bone at tendon and, without local tenderness, 173
 Ligamentum ovall program, Fibroid of, 302
 Ligation, of portal vein in suppurative portal phlebitis, 091; of splenic vessels as substitute for splenectomy in blood diseases, 601
 Limits plastica hypertrophica, 285
 Lipoid sarcoma, Gonococcus complement fixation a new, 653
 Liver, Abscess of, 354; Operative treatment of abscess in carbosis of, 604; Study of, function in normal pregnancy, 043
 Local anesthesia, in herniotomy, 233; in laparotomy for multilocular ovarian cyst, 439; Radical amputation of breast under, 303
 Lower limbs, Amputations of, 307
 Luteal arthralgias, 307
 Lumbar puncture, in nervous shock and wounds of skull in war, 171; Danger of, 309
 Lumbar spine, Gunshot wound of, 310
 Lumbosacral region, Lesions of, 508
 Lungs, Extraction of projectiles from, 55; Extraction of foreign bodies from, 271; Removal of fragment of shell from, 272; Abscess and bronchiectasis from surgical point of view, 251; Gangrene of, 252; Primary nature for laceration of, in field, 058; Gunshot injuries of, 372; Gunshot wounds of, and tuberculosis, 371; Multiple metastatic sarcomata of, 318
 Lymphatic glands, Primary neoplasms of, including Hodgkin's disease, 470
 Lymphatics, Edema of, in ascending renal infection, 647; Focal inflammation of iliac fossa following simple epididymitis; the anatomy of, 031
 MACEWEN'S sign, 417
 Magnesium, as treatment for tetanus and as narcotic, 74; Treatment of septic wounds in war by, sulphate solution, 391
 Malformations, Congenital, of rectum, 101
 Malignant, What is the newer methods of treatment after the patient with disease of uterus, 201; chondroma from mesenchymal origin, 200; Treatment of, neoplasms, 401; Metastatic reaction in, tumors, 203; Irritation as factor in tumor development, 417; Changes in leucocytes in, disease, 517; Tumors of gall bladder, 506; testicle, 651
 Marriage, 361
 Mastoiditis, Acute purulent otitis media complicated by, and temporomastoid abscess, 101; Suture of, 225
 Mastoid, After-treatment of, wound, 101; operation dependent upon pathology, 337; Discharging, sinuses, 655; Value of blood-clot in, operation, 655; Skin-grafting in, operations, 656
 Maternity practice, Antenatal clinics and pre-, at Edinburgh Royal Maternity Hospital, 544
 Maxillary sinus, Relation of teeth to, 509; Radical operation of, under local anesthesia, 662; When shall we operate in chronic, 562
 Maxilla, Abscess in suppurative and hyperplastic osteomyelitis of inferior, 470
 Mayo method, Operative treatment of bunions by, 182
 Mechanical derangement of knee joint, 175; aids to sterility displacements, 610
 Mechanics of renal infection, 647
 Mechanism of labor in spontaneous evolution, 209
 Medical service, War in regard to organization of, 203
 Medicosuitary aspects of European War, 407
 Metastatic reaction, Diagnostic value of, 70; in malignant tumors, 203; Value of, 403
 Melena neonatorum, Transfusion by citrate method in sixty-hour-old baby with, 403
 Meningitis, Treatment of cerebrospinal, 305
 Menopause, Subcutaneous transplantation of ovarian tissue; effect of such plantation on, 303
 Menstrual, Construction of artificial vagina with establishment of, function, 304; Use of luteum extract in treatment of, disorders, 134; Statistics, 314
 Menstruation, Relation between the degree of menstrual reaction in endometrium and clinical character of, 83; Reappearance of, after childbirth, 211
 Mental status, Incidence of syphilis among juvenile delinquents; its relation to, 331
 Mercarial poisoning from vaginal douche, 205
 Mercuric chloride solution, Liability for death of hospital patient claiming to have drunk, 614
 Mesometrium, Tracheloplastic methods and results based upon the physiology of, 532
 Mesothorium treatment in cancer of uterus, 415
 Metabolism studies in hemophilia, 631
 Mice, Origin of tumors in, 276, 404; Effect of roentgen rays on rate of growth of spontaneous tumors in, 406
 Middle ear, Suppurative inflammation of, after removal of nasopharyngeal tumors with galvanocautery loop, 200; Thiersch graft in operation for, suppurations, 331
 Military, Experiences of German, surgeons, 81; Fat embolism in, surgery, 194; General anesthesia with ethyl chloride in, surgery, 191; surgery at front, 411; Medico-, notes from Belgium war zone, 048
 Military—See also Injuries, Wounds, Gunshot, Shrapnel, War, Sterilization, Shell
 Mineral water, Arthritis treated with radio-active, 173
 Mixed labor, 211
 Mobilization of ankylosed joints, 266
 Mole, Hydatidiform, 86
 Morphine, and scopolamine amnesia in obstetrics, 05, 05; and scopolamine action upon intact uterus, 405; Response of surviving uterus to, and scopolamine, 405; Relation of, to post-operative complications and immunity, 474

Mortality, Cancer, 187; from puerperal fever, 210; from cancer in Western Hemisphere, 618
 Moschowitz' operation; inguinal route for femoral hernia, 136
 Mouse tumors, Action of autolysin on, 517
 Mouth, Cancer of, successfully treated with radium, 103; Chloramine in treatment of wounds of, and jaws, 477; Treatment of cancer of tongue and, 564
 Mucous membrane, Treatment of skin and, cancer, 186
 Muscle transplantations in shoulder girdle, 609
 Musculature, Study of, of pylorus, 59
 Myeloid tumor of tendon sheaths, 128
 Myoma, Cervical, 300; Coexistence of, and malignant tumor and significance in treatment of myoma, 301
 Myositis ossificans traumatica, 177

NAIL, extension in fracture of femur, 392
 Narcotic, Magnesium as treatment for tetanus and as, 74
 Nares, Congenital occlusion of posterior, 657
 Nasal accessory sinus, Examination of, showing value of routine examination and internasal operative proceedings, 103; Influence of, disease upon ear, 216; Roentgenology of, with reference to sinusitis in children, 217; Sudden blindness due to suppuration of, 445; Focal infections of, 559
 Nasal, Obstruction of, orifices, 447; Operation for draining lacrymal sac and, duct into unciform fossa, 552; Embedding, canal in treatment of dacryocystitis, 553; Relation of, disease to headache, 558; Origin of, antral polyp, 558; Successful treatment of, affections, 668
 Nasopharyngeal tumors, Suppurative inflammation of middle-ear after removal of, with galvanocautery loop, 101
 Nasopharynx, Spindle-cell sarcoma of, 217; Angeliobroma of, 658
 Nausea of pregnancy, Corpus luteum extract in, 643
 Neoplasia, Diagnosis of intrathoracic, by exploratory puncture, 54; Treatment of malignant, 400; Hematuria in renal, 430; Primary, of lymphatic glands including Hodgkin's disease, 470; Anatomic distribution of cutaneous, 515
 Nephrectomy, 60; under local anesthesia, 322; Anuria in patient on whom left, had been done, 420; End-results of renal tuberculosis treated by, 412; during pregnancy, 433; Management of pneumothorax occurring as complication of, 433
 Nephropathic, Inhibition of toxicity of uranium nitrate by sodium carbonate and protection of kidney acutely, from uranium from toxic action of anesthetic by sodium carbonate, 648
 Nervous, Non-penetrating injuries of skull by bursting of shells and, lesions caused by them, 75; Means of preventing injurious action of anesthetics on central, system, 32; Surgery in war injuries of, system, 290
 Nerve-trunks, Physiological treatment of bullet and shell wounds of peripheral, 615; Diagnosis of complete interruption of great, of limbs, 616
 Nerves, Peripheral, Gunshot injuries of, 66, 67, 185; Biology of, in transplantation, 185; Treatment of injuries of, during war, 275; Biology of, in transplantation; life of peripheral nerves of mammals in plasma, 614; Operative treatment of gunshot injuries to, 615
 Nerves, Treatment of injuries of, by projectiles, 67; Injuries of, especially of sciatic, 309; Early operation, mechanics of, injuries and technique of suture, 400; Cicatrization and restoration of function of injured, 400; Translabrynthine operation for tumors of acoustic, and pontocerebellar angle, 478; Sheaths for,

after suture, 314; Operative indications furnished by histologic examination of, injuries in war, 616; Early reappearance of function in resected and reunited, 616; Galalith in, tubulization, 617; Freeing of, and functional recuperation, 617
 Neural surgery, 68
 Neuralgia after gunshot injuries, 524
 Neurology in war, 274
 Neurolysis, Technique of, 68
 Nueroses, Hysterical joint, with reference to hip, 174
 Newborn, Intracranial hemorrhage in, 213, 406; Diagnosis of intracranial bleeding in, 541; Care of, 644
 New growths of prostatic urethra in tuberculosis, 128
 Nitrous oxide, analgesia in obstetrics, 93, 94; Technique of, administration in obstetrics, 645
 Nose, throat and accessory sinuses in etiology of chronic infectious arthritis, 176; Blood-platelet extract, physiological hemostatic in, and throat surgery, 332; Correction of depressed fractures of, by transplant of cartilage, 390; Opening frontal sinus through, for chronic suppuration, 447; Conservatism and radicalism in surgery of ear, and throat, 557
 Nystagmus, Localization of cerebellar tumors, posterior growths without, 150

OBLITERATION, Operation for, of cavity in tibia remaining after sequestromy, 63
 Obstetrical, Tropical, problems, 542
 Obstetrics, Fixation of uterus and consequences in, 417; Pituitrin in, 424; Relation of, gynecology and abdominal surgery to public welfare, 542; Borderline between operative and non-operative treatment in gynecology and, 640; Endowment of childhood from, standpoint, 644; Technique of nitrous-oxide administration in, 645; Knee-chest position as prevention of, morbidities, 646
 Obstruction, Diagnosis of biliary, by calculus, 384; Prostatic, and sequelae, 436; of nasal orifices, 447; Chronic intestinal, versus intestinal stasis, 491
 Occlusion, in treatment of aneurisms, 330; Total, of right external auditory meatus, 556; Congenital, of posterior nares, 657
 Ocular surgery in ambulance at the front during the first year of war, 555
 Oedema, Operative treatment of, and varices of lower extremities due to thrombosis of femoral vein, 280; Traumatic, of hand, 608; Dorsal, of foot, 611
 Oesophageal stenosis, Simulation of, by extensive carcinoma of lesser curvature of stomach, 488
 Oesophagotracheal fistula, 372
 Oesophagus, Diagnosis and removal of foreign bodies in trachea, bronchi, and, 153; Post-typhoid ulceration and stricture of, 483
 Old age, Prostate gland in, 438
 Old art and new science of surgery, 191
 Omental grafts, Use of free, in abdominal surgery, 480
 Open-air treatment in surgery, 361
 Operative indications furnished by histologic examination of nerves injured in war, 616
 Operative procedure, When is prostatic fit for, 97
 Operation, on minor without consent of parent, 413; on wife without consent of husband, 414; When is prostatic fit for, 430; Surgical, during pregnant state, 540
 Ophthalmia neonatorum, State legislation concerning, 553
 Ophthalmic, Some rare, war cases, 553
 Opium alkaloids, Analgesia produced by, 475
 Opsonic index, Prognosis in surgery based on, 624
 Optic nerves, Changes in visual fields, result of vascular lesions in brain and, 444
 Orbit, Malignant tumors in and around, 443

- Oncidectomy, Operative treatment of tumors of testicle, thirty cases treated by, 39
- Otitis, Labyrinthine, its relation to, 448
- Otitis, Obstruction of canal, 347
- Origin of tumors, Further investigations of, in mice and part played by internal secretion in spontaneous development of tumors, 618
- Orthopedic treatment, of disabilities resulting from infantile paralysis, 64 Character of, summary and its importance during period of infantile paralysis, 612
- Orthopnea, Preventive, in infancy and childhood, 272; War, 300
- Osteitis gonitidis, 602
- Osteitis deformans, New cases with complete metabolism, 65
- Osteochondritis deformans, Late deformities in reduced congenital hips and, juvenilis, 611; coxa juvenilis, 611
- Osteoma of frontal sinus, 428
- Osteoplastic flap, Restoration of loss of cranial substance by insertion of an, from external table of skull in viability, 381
- Osteopneumothorax, Abscess in suppurative and hyperplastic, of inferior maxilla, 476
- Osteoplastic approach to brachial plexus below clavicle, 314
- Osteotomy of extremities, 308
- Ovar, Brain induction of, origin, 320
- Otitis media, Acute purulent, complicated by mastoiditis and tympanocephalic abscess, 101; Some complications in connection with acute, 101; Acute, in infancy and early childhood, 116; Subacute purulent, labyrinthitis and purulent labyrinthitis due to capsulated streptococcus, 117; Intracranial complications of chronic suppurative, 444; Brain and sinus complications of, 416
- Otitis, Corrective, 448
- Otolaryngology, Local anesthesia in, 657
- Ovarian, Functional ovarian cysts of appendix and ruptured pseudomucosa, 350, 357; Local anesthetic laparotomy for multilocular cyst, 419; Subcutaneous transplantation of tissue, effect of such transplantation on menopause, 303; Influence of peptone on tolerance of body for homogeneous transplants, 303
- Ovarian peritonitis, Pilonid of ligamentum, 307
- Ovaritis, Peritonitis following acute, of vaginal origin, 637
- Ovariotomy, Proboscis, 303; Operative conservation of, 302; Is partial fixation of sclerotic, justified, 303; Tumors of, 419
- Oxygen, Use of, in treating gas phlegmon, 268
- Oxyuris vermicularis in etiology of appendicitis, 384
- PAGET'S disease, 314**
- Palliative treatment of facial paralysis by planting of soft subcutaneous parts, 614
- Pallid, Toxic, complicating pregnancy, 318
- Pancreas, Gynecology and, 60; Influence upon spleen and thyroid of complete removal of external function of, 360; Acute surgical diseases of, 380
- Panniculitis, 440
- Panduit method, Fluorescent screen localization by, 282
- Panduit, Orthopedic treatment of some disabilities resulting from infantile, 64; Treatment of, of radial nerve, 600; Tendon fixation in infantile, 603; Character of orthopedic treatment necessary and its importance during period of infantile, 611; Palliative treatment of facial, by planting of soft subcutaneous parts, 614
- Paralysis, ankle joint, 183; valgus bone-joint graft in painful flat-foot, 64
- Paralysis, Complete section of spinal cord followed by partial restoration of sensation and movement in regions previously, 614
- Paraplegia, Fractures of spine without, 612
- Parasomnolysis empyema, 483
- Parathyroid, Tumors of, 307; Surgical anatomy of thyroid with reference to, glands, 481
- Paronychia, Acute, hypertrophy of breast, 308
- Pateila, Tuberculosis of, 173; Operative treatment of closed fractures of, 180
- Pediatrics, Proper position of tonsillectomy in, 103
- Pelvic, Action of radium on cancers of, organs, 300; Advantages of vaginal section in, surgery, 304; Relation of, to abdominal surgery, 304; Dorr's claim in right kidney associated with left kidney, 400; Treatment of, adhesions, 323
- Pelvis, Contracted, and difficult labor, 61; Roentgen measurement of, 314
- Penetrating wounds of abdomen treated at front, 26
- Penis, Injury of, with successful repair, 306; Cancer of, 346
- Peptone, Influence of, on tolerance of body for homogeneous ovarian transplants, 308
- Perforation, Roentgen diagnosis of intestinal, 163; Typhoid, 260; of gastric and duodenal ulcers, 390; of biliary tract, 381; Penetrating abdominal wound with multiple, of small intestine, 602
- Pericarditis, Suppurative, 311
- Pericardium, Injury with extravasation of blood in, 483
- Perineal, Technique for, and rectosigmoid operation, 88; Method to lessen, and vaginal tears during childbirth, 91; Epithelium a, safety measure, 90; Congenital, testicle, 213; or suprapubic prostatectomy, 440
- Perinorrhaphy, Immediate, 437
- Perinephritic abscesses, 316, 649
- Perineum, Improved method for repair of lacerated, 87; Repair of complete laceration of female, 637
- Periosteal abscess of maxillary sinus, 203
- Peripheral nerves, Injuries of, in war, 113
- Peritoneal, adhesions, and their relation to intestinal stasis, 376; Drainage of, cavity, 376; Origin of retro-, cystic tumors, 307
- Peritonitides, Iodine in combating, 374
- Peritonitis, 373; Management of, 373; Drainage in, after appendicitis, 108; Operative treatment of diseases of adnexa and relation to, 303; Case of bacterial, 308, following acute ovaritis of vaginal origin, 637
- Peritoneum, Lavage of, with ether, 36
- Peritonitis, Treatment of, abscess by tonsillectomy during acute stage of disease, 448
- Pernicious anemia, Blood transfusion with six cases of, treated by massive blood transfusion and splenectomy, 37
- Petal, Triangle of, in kidney surgery, 211
- Phlebotomy, Ligation of portal vein in suppurative portal, 304
- Pituitary gland, Does the, contain epinephrine or a compound similar to it, 479
- Pituitrin, in obstetrics, 414; Abuse of, intrauterine, 406
- Placental, bacteremia, 313; Management of, previa, 300
- Placenta, Premature separation of normally implanted, 311; Active substance contained in, and in corpus luteum, 400
- Plastic, covering of defects of dura after excision of brain prolapse, 21; Circular resection and suture of trachea and, reconstruction of large defects in trachea, 36; operations for deformities of larynx, 420; surgery in kidney pelvis and ureters, 373; Technique of secondary, operations on amputation stumps, 308
- Plates, Use and abuse of Lane, 303
- Plating problem, Bone, 307
- Pleurisy after gunshot injuries of thorax, 370
- Pleura brachialis, Neuromyia of, 183
- Pneumococcal arthritis, 116
- Pneumodynamics of empyema, 480

- Pneumolysis, Extrapleural, and filling by Baer's method, 333
- Pneumonic empyema and its treatment, 395
- Pneumoperitonitis, Symptomatology and treatment of, 374
- Pneumothorax, Artificial, 349; Artificial, in treatment of pulmonary tuberculosis, 369; Management of, occurring as complication of nephrectomy, 433
- Poisoning, Six hundred and eighty-five cases of, by noxious gases used by enemy, 627
- Polymyositis, Manifestations of, 64; Serotherapy of, 613
- Polyp, Origin of naso-antral, 338
- Polyp, Intervention of intralaryngeal, 449
- Polypus of fallopian tube, 303
- Post-operative, Right-sided hypertension with cardiac dilatation as, complication, 70; Glucose solutions as prophylactic against, shock, 189; ureteral fistula, 341; renal infection, 324; Primary and, treatment of prostatectomy, 440; Morphine to, complications and immunity, 474; Etiology of, or wound scarlet fever, 474
- Post partum hemorrhage, Immediate treatment of severe, 643
- Potassium iodide, Absorption of, by perfused thyroid glands and some factors modifying it, 480
- Pott's disease, treated by operation, 510; Dangers of Albee operation in, 613
- Pott's paralysis, Bone transplantation in, 510
- Pouch of Douglas, Fecal abscess in, following typhoid, 416
- Precancerous dermatoses, 401
- Pregnant state, Surgical operations during, 540
- Pregnancy, Ectopic, 422; Inaugural symptoms of, 207
- Pregnancy, Tubal, 432; Bilateral, 89; Double, 423; Diagnosis of, 332
- Pregnancy, Serum skin test for, and different pathological conditions, 210; Kidney function in normal and diseased women during, and puerperium, 308; Nephrectomy during, 433; Dermoid cyst free in abdomen during, 306; Blood-pressure during, 314; Chorio-epithelioma after last preceding, 430; Cystoscopic examinations during, 422; Corpus luteum of, as it is in ovine, 512; Corpus luteum extract in nausea of, 643; Toxic palsies complicating, 338; Glycosuria in, 339; Experiences with Kiutsi-Malone urinary test for, 641; Pulmonary tuberculosis and, 642; Appendicitis during, 642; Study of liver function in normal, 643
- Premature separation of normally implanted placenta, 311
- Prenatal care, 428
- Preparatory treatment for prostatectomy, 97
- Preparedness, Relation of physician to national, 631
- Presentation, Spontaneous evolution of transverse, 309; Causes influencing, at delivery, 426; Delay in breech, from extension of legs, 643
- Preservation of wounded hand, 389
- Prevention, of fistula in ano, 169; of injurious by-effects in treatment of deep-seated carcinomata with radium and mesothorium, 193; of deformity following fracture of resection of jaw; plea for use of splints, 427; and treatment of puerperal fever, 644
- Preventive orthopedics in infancy and childhood, 272
- Procidencia, Vaginal supravaginal hysterectomy for, and large cystoectocoele with chronic fibrosis uteri, 418
- Prognosis in surgery based on opsonic index, 611
- Prosthetics, Injuries of nerves from, 309
- Prolapse, of bladder and uterus, 86; Surgical treatment of, of uterus, 416; of bladder and uterus, 531
- Prolapsed ovaries, 203
- Prolapsus, Ventrofixation of uterus for relief of, 302; of the uterus, 531
- Prophylactic, Intermediate tracheorrhaphy, its use as, against pernicious effects sometimes caused by laceration of cord, 304
- Prophylaxis, Etiology and, of carcinoma, 187; Antitoxin, in traumatic tetanus, 186
- Prostatectomy, 350; Preparatory treatment for, 97; Sexual functions following suprapubic, 97; Suprapubic, 98; 314; 441; Perineal or suprapubic, 440; mistakes and failures, 430; primary and post-operative treatment, 440
- Prostatic, When is, fit for operative procedure, 97; 439; New-growth of, urethra in tuberculosis, 108; calculus, 436; obstruction and sequelae, 416; abscess of tuberculous origin, 547
- Prostatitis, Chronic, 347
- Prostatitis, Bacteriology of chronic, and spermatozoitis, 653
- Prostate gland, Human, in youth, 96; Primary tuberculosis of, 320; in old age, 438
- Prostate, Cancer of, 96; Adenoma of, 96; Complement-deviation test as guide in infections of urethra, and vesicle, 99; Incipient hypertrophy of, 314; Diagnosis and treatment of enlarged, 437; Sarcoma of, 437; Cysts of, 438; Prostatitis, 547; Operations by local anesthesia on external genitalia and, 653
- Protective devices for X-ray operations, 192
- Protheses, in amputations of arm, 610; Hand and arm, of maimed in war, 610
- Pseudarthrosis, Fixation methods in treatment of fractures of, 180; Treatment of delayed callus formation and, with fibrin injection, 383
- Pseudofracture of sesamoid bone of big toe, 63
- Ptoxis, Visceral, cured by Rovsing's operation, 380
- Puerperal fever, Mortality from, 210; Prevention and treatment of, 644
- Puerperal infection, 210; Prevention and treatment, 313; Treatment of, 423, 426
- Puerperal sepsis, Crime of, 94
- Puerperal septicaemia, 425
- Puerperium, Kidney function in normal and diseased women during pregnancy and, 308; Creatin and creatinin excretion during, and their relation to involution of uterus, 423
- Pulmonary abscess, Medical aspects of empyema and, 429
- Pulmonary tuberculosis, Artificial pneumothorax in treatment of, 369; and pregnancy, 642; Larynx in one hundred cases dying of, 659
- Purulent infection, Positive method of curing, 195
- Pyelitis, 431; Gonorrheal uretero-, treated by injections of antimeningitic serum, 323
- Pyelography, Results in eighty cases of, 95; Technique of, 648
- Pyelolithotomy in renal calculi, 431
- Pyritic spasm, Significance of, 400
- Pyroplasty, Gastro-enterostomy compared with, 162; for congenital pyloric stenosis, 330
- Pylorus, Study of the musculature of, 59
- Pyoculture and Dakin's fluid, 625
- Pyonephritis graviorum, 91
- Pyorrhea alveolaris, Relation of amebiasis to, 603
- R**ADIAL nerve, Treatment of paralysis of, 400
- Radical operation for cervical cancer, 633
- Radio-biological, Cause and cure of cancer in light of recent research, 283
- Radiographic, Use of intensifying screens in, work, 284
- Radiography plate, Fluoroscopic screen and, in diagnosis of medical and surgical lesions of alimentary tract, 284
- Radiologic, One year's work of two, wagons, 303; method by means of thorium X, 627

- Radiology of movements of diseased stomach, 285
- Radiologic localization by means of screen perforated with lead threads, 343; Extraction of intracranial projection in two stages; trypsinization for avians after radiographic localization, extraction under screen, 293
- Radiotherapy, Efficiency of Coe tube and rationale of, in treatment of malignant tumors, 77; of carcinoma of uterus and breast, 202; of bone and joint tuberculosis, 262; Deep action of, 282; Changes in blood caused by, 284; in spastic affections of spinal cord from war injuries, 305
- Radium, Cancer of mouth successfully treated with, 101; Prevention of infection by-effects in treatment of deep-seated carcinomata with, and mesothorium, 193; treatment of malignant tumors, 284; in treatment of carcinomata of cervix uteri and vagina, 296; therapy of cancer of cervix, 298; therapy in treatment of cancer of uterus, 301; Action of, on varicose of pelvic organs, 300; Local application of, supplemented by roentgen therapy, 305
- Reaction, Specificity of Alsterhelden, 70; Diagnostic value of mesothorium, 71, 203
- Reconstruction of common bile-duct, 69
- Rectal as substitute for vaginal examination in labor, 437
- Rectosigmoid, Technique for perineal and, operation, 88
- Recto-urethral anomaly, Points in normal anatomy, 127
- Rectum, High amputation of, 384; Stricture of, 405; Abdominoperineal excision of, 405
- Rectus sheath, Congenital desmoid tumor of, in infant, 283
- Red Cross, With the American, in Belgium, 629; Personal experiences at, hospitals at Pau, France, 629
- Reducing substance, Nature and quantitative determination of, in normal and pathologic cerebrospinal fluid, 479
- Reflex manifestations of intranasal origin, nerve paths through which they travel and operations for relief, 332
- Regeneration, Bone, 264
- Renal, Errors in diagnosis of, infection, 316; Vesical symptoms in diagnosis of, conditions, 320; pain, diagnostic and clinical significance, 322; Post-operative infection, 324; Hematuria in, neoplasm, 430; Errors in diagnosis of, and ureteral calculus, 317; Pyelolithotomy in, calculus, 411; Errors in diagnosis of, and ureteral calculus, 344; tuberculous, 431; tuberculous, diagnosis, treatment, and results, 432; End-results of, tuberculous treated by nephrectomy, 437; function tests, 433; Determination of, function by index of renal elimination, 438; Vesical symptoms in diagnosis of, conditions, 444; Mechanics of, infection, 647; Role of lymphatics in ascending, infection, 647
- Repair of lacerated perineum, 47
- Resected, Early reappearance of function in, and reunited nerves, 626
- Resection, Circular, and suture of trachea and plastic reconstruction of large defects in trachea, 34; Partial, of sclerotic ovaries justified, 303; of elbow for ankylosis from war injuries, 304
- Respiratory passages, Upper, in habitual users of cocaine and heroin, 418
- Results, in eighty cases of pyelography, 65; Late, of cholecystectomy, 154; End-, of operations on gall bladder, 170; End-, of bone fractures, 181; Operative treatment of bad, after fracture, 170; of excision of transverse process of fifth lumbar vertebra, 274; Factors that make better, in cranial surgery, 304; Callies' fracture, treatment and, 303; End-, in simple fracture, 297; Operative treatment of bad, after fracture, 303; of thirty-five transurethra, 423
- Resuscitation by means of preserved living erythrocytes in experimental hemorrhaging gas asphyxia, 320
- Retrosplacental displacement of uterus, 630
- Reversion of uterus, 416
- Rheumatic fever, Experimental arthritis in rabbits; contribution to pathology of arthritis in, 409
- Rhinoplasties, 560
- Rickets, 172; Roentgenographic appearances in, 287
- Ringworm, X-ray treatment of, of scalp, 326
- Roentgen diagnosis, of fracture of skull, 170; of intestinal perforation, 163; of gastric cancer, 173
- Roentgen examinations, of abdomen in directions parallel to each other, 284; of genito-urinary tract, 422
- Roentgenotherapy, for angiomata, 50; Technique and experimental application of hard rays for deep, 295; in post-operative treatment of carcinomata of breast, 298; Cause and prevention of constitutional symptoms following deep, 286; Local application of radium supplemented by, 626; Modern, intensive and deep, with description of new apparatus for intensive therapy, 626
- Roentgenization, Choice between operation and, of uterine fibroids, 82
- Roentgenogram as aid in fracture work, 170
- Roentgenographic appearances in rickets, 287
- Roentgenology of accessory nasal sinuses with special reference to sinusitis in children, 317; of skull, 140
- Roentgenoscopy versus serial roentgenograms, 285
- Roentgen, ray in gastro-intestinal affections, 174, 174-observation of gall-bladder and hepatic ducts after perforation into duodenum, 262; Value in diagnosis of, picture of fractures, 268; Treatment of actinomycosis with, rays, 286; measurement of pelvis, 314; Tumor of spinal cord treated with, rays, 328; Effect of, rays on rate of growth of spontaneous tumors in mice, 406; Treatment of carcinoma of uterus with, rays, 415
- Root abscesses, Focal points of infection in, 663
- Rovsing's operation for gastrocolic fistula, 56; Visceral ptosis cured by, 380
- Rupture, Emergency treatment of, of uterus and ruptured ectopic pregnancy, 87; Complete intraplacental uterine, during labor, 95; Spontaneous, of uterus, 207; Autotransfusion of blood in extra-uterine pregnancy and, of uterus, 422; Oxycephalic cephalohalos with traumatic, of both eyes, 215; Loosening and, of symphysis, 311
- SACROCOCCYGEAL, Malignant chordoma from, region, 309
- Sacro-iliac region, Anomalies of, in X-ray picture, 111
- Sarcomatous proliferation in traumatic tumor, 113
- Sarcomata, Multiple metastatic, of lungs, 316
- Sarcoma, Spindle-cell, of nasopharynx, 217; of upper jaw symptomatically cured by X-ray, 246; Traumatic, of femur, 380; Rasmussen vaginal, in children, 479; of prostate, 437
- Sardou's test for blood in urine, 98
- Scalp, X-ray treatment of ringworm of, 326
- Scarless incisions, Harelip surgery; essentials in production of, 52
- Science of surgery, Old art and new, 101
- Scoliiosis, Treatment of structural, 65; Etiology of habitual, 613
- Scopolamine, Morphine and, amnesia in obstetrics, 40; 41; morphine, scopolamine pantothen, and scopolamine-narcotine in labor, 411; Morphine and, action upon intact uterus, 413; Response of surviving uterus to morphine and, 417
- Screens, Use of intensifying, in radiographic work, 283

- Section, Complete, of spinal cord followed by partial restoration of sensation and movement in regions previously paralyzed, 614
- Seldelin bodies. Occurrence of bodies resembling, in anemic and fatal blood, 519
- Semilunar bone, Dislocation of, 503
- Seminal folliculitis, 652
- Sensitometry, X ray, 192
- Separation of lower epiphysis of tibia, 393
- Sepsis, Uterine fibroids in production of, 84; Crime of puerperal, 94
- Septa, Treatment of deflected nasal, 560
- Septic. Bacteriology of, wounds, 280; Disinfection of, joints, 390
- Septicemia, Puerperal, 425
- Septum, Deviations of, 658
- Sequela, Prostatic obstruction and, 436
- Sequestromy, Operation for obliteration of cavity in tibia remaining after, 63
- Serology, Pathological study of syphilitic aortitis and its, 530
- Serotherapy of poliomyelitis, 613
- Serum, Results of applying a quantitative method to Abderhalden, test for cancer, 72; skin test for pregnancy and different pathological conditions, 210; Antitoxin content of, of tetanus patients, 281
- Sesamoid bones, Fractures of, of thumb, 179
- Sexual, functions following suprapubic prostatectomy, 97; Hypertrichosis; variations in female secondary, characteristics and internal secretions, 637
- Sheaths for nerves after suture, 514
- Shell, Removal of fragment of, from lung, 252
- Shock, Glucose solutions as prophylactic against post-operative, 189; Peripheral vasomotor changes in, 277; Epinephrin and transfusion in treatment of, 277; Condition of vasoconstrictor center during development of, 620
- Shoulder, Common, injuries, 173; Reducing dislocations of, 271; Roentgen examination of, in directions parallel to each other, 284; Muscle transplantations in, girdle, 609
- Shrapnel bullet in bladder, 289
- Sideroscope, Use of, for detecting iron in eye, 215
- Sign, Macewen's, 412; and symptoms of impending death, 519
- Sigmoid, Inter-, retroperitoneal hernia, 169
- Sinusitis, Examination of nasal accessory, showing value of routine examination and internal operative proceedings, 101; Frontal and maxillary, and sequelae due to staphylococcus pyogenes albus, 558; When shall we operate in chronic maxillary, and what form of operation shall we choose, 662
- Sinus, Subperiosteal abscess of maxillary, 103; Nose, throat and accessory, in etiology of chronic infectious arthritis, 176; Influence of nasal accessory, disease upon ear, 216; Roentgenology of accessory nasal, with special reference to sinusitis in children, 217; Obliteration of lateral, as method of venous haemostasis in injuries of upper cervical region, 246; Injuries of superior longitudinal, 287; Cure of unrecognized, thrombosis discovered during operation, 446; Non-operative treatment of accessory, 447; Opening frontal, through nose for chronic suppuration, 447; Osteoma of frontal, 478; thrombosis with reference to pathology, 556; Focal infections of accessory nasal, 559; Deflected septum as causal factor in, diseases, 559; Treatment of infections of accessory, 559; Relation of teeth to maxillary, 562; Discharging mastoid, 653; Radical operation of maxillary, under local anaesthesia, 662; Roentgen ray diagnosis in diseases of accessory, 657
- Situs viscerum inversus with gall-stones, 171
- Skin, Treatment of, and mucous membrane cancer, 186; Serum, test for pregnancy and different pathological conditions, 210; Abdominal, flap in radical amputation of breast, 568
- Skull, Treatment and prognosis of gunshot injuries of, 52; Covering defects of, 53; Non-penetrating injuries of, by bursting of shells and nervous lesions caused by them, 75; Lumbar puncture in nervous shock and wounds of, in war, 77; Roentgen diagnosis of fracture of, 152; Roentgenology of, 246; Repair of, after trephining, 247; Treatment of tangential wounds of, 286; Surgery of penetrating injuries of, at front, 283; Fractured, with healed attic suppuration of an unusual type, 477; Consideration of a basal fracture of, 477; fractures, 478; Reparation of loss of, substance of face, 591; Immediate treatment of penetrating, wounds, 591; Fracture of base of, 591; Restoration of loss of cranial substance by insertion of osteoperiosteic flap cut from external table of, 592; Treatment of war wounds of, 628
- Small intestine, Treatment of gunshot wounds of, 289
- Sodium citrate method of indirect transfusion of blood, 190
- Speech, Can, present a sign of congenital syphilis, 313
- Spermatocystitis, Bacteriology of chronic prostatitis and, 653
- Spina bifida, 184
- Spina ventosa, Radiotherapy of bone and joint tuberculosis, 265
- Spinal, Gunshot injuries of, column and cord, 273; anaesthesia with stovaine, 476; Extraction of exploring needle broken in attempting to do a, puncture, 509
- Spinal cord, Injuries of, in war, 76; Radiotherapy in spastic affections of, from war injuries, 308; Tumor of, treated with roentgen rays, 308; Complete section of, followed by partial restoration of sensation and movement in regions previously paralyzed, 614
- Spine, Treatment of rigid rotary lateral curvature of, by brace, 66; Bone-graft for tuberculosis of, 66; Unilateral rotary displacement of cervical, 184; Ankylosation of, 184; Typhoid, with autopsy findings, 184; Treatment of tuberculous diseases of, 273; Gunshot wound of lumbar, 510; Early diagnosis of tuberculosis of, 612; Fractures of, without paraplegia, 612
- Splenectomy, 263; Simplified method of blood transfusion with pernicious anemia treated by massive blood transfusion and, 72; Banti's symptom-complex with relation to, 171; in chronic anemias, 387; for Von Jaksch's anemia, 498; Ligation of splenic vessels as substitute for, in blood diseases, 607
- Splenomegaly, Pathology of, 171
- Spleen, Influence upon, and thyroid of complete removal of external function of pancreas, 386
- Splint, for compound fractures of arm, 391; Adjustable, for treatment of fractures, 392; Prevention of deformity following fracture of resection of jaw; plea for use of, 477
- Spondylitis, typhosa, 612; Traumatic, 612
- Spontaneous evolution, Mechanism of labor in, 309; of transverse presentation, 309
- Sporotrichosis, Osseous, 607
- Squint, Operative treatment of, 556
- Stab wound, Technique for making suprapubic, 484
- Staphylococcus pyogenes albus, Frontal and maxillary sinusitis and sequelae due to, 558
- Stasis, Chronic intestinal, 164; Newer conceptions of intestinal, 258; Intestinal, 387, 401; Chronic intestinal obstruction versus intestinal, 401; Chronic intestinal, and its associated so-called toxemia, 402; Recent research work in intestinal, 402, 604

- Concerning surgical anatomy of, with reference to parathyroid glands, 481
- Thyroidectomy, Further experience with use of wire tourniquet in partial, 484
- Tibia, Operation for obliteration of cavity in, remaining after amputation, 631; Separation of lower epiphysis of, 501; Traumatic separation of superior epiphysis of, 500
- Toe, Pseudo-fracture of sesamoid bone of big, 63
- Tongue, Treatment of cancer of, and mouth, 590; Abscess of, 664
- Tonsillectomy, Proper position of, in pediatrics, 333; Treatment of peritonsillar abscess by, during acute stage of disease, 448
- Tonsillitis, Appendicitis as sequela of, 168; Chronic, 561
- Tonsils, and chronic cervical adenitis, 117; Surgical anatomy of capsule of faucial, 318; Faucial, as portal of entry in tuberculous cervical adenitis, 448; Some phases of, question, 580; technique, 560; Anatomy of, 659
- Torticollis, relieved by tenotomy of inferior oblique, 552; Congenital, 502
- Tourniquet, Further experience with use of wire, in partial thyroidectomy, 484
- Toxemia, Cholecystectomy and cholecystic, 170; Chronic intestinal stasis and its associated so-called, 492
- Toxic palsies complicating pregnancy, 538
- Trachea, Circular resection and suture of, and plastic reconstruction of large defects in trachea, 54; Diagnosis and removal of foreign bodies in, 153; Gunshot wounds of larynx and, 379
- Tracheoplastic methods and results, 532
- Tracheorrhaphy, Intermediate, 504
- Transfusion, Technique of, 72; Simplified method of blood, with pernicious anemia treated by massive blood transfusion and splenectomy, 72; Sodium citrate method of indirect, of blood, 100; Epinephrin and, in treatment of shock, 377; Citrate method of blood, in children, 403; by citrate method in sixty-hour-old baby with melana neonatorum, 403; Simplified methods of, 530; of blood with special reference to use of anticoagulants, 612; Thirty-five, 613
- Transplants, Fate of free bone, 64; Influence of peptone on tolerance of body for homogeneous ovarian, 303; Reparation of loss of skull substance by cartilaginous, 501
- Transplantable carcinoma of guinea pig, 610
- Transplantation, Biology of peripheral nerves in, 185, 614; of thymus, 350; of bone marrow, 571; of cartilage in reparative surgery, 372; Subcutaneous, of ovarian tissue, 303; Correction of depressed fractures of nose by, of cartilage, 300; Autoplastic bone, 303; Fascia, in treatment of old fractures of patella, 306; Bone, in Pott's paralysis, 510; of testicle into abdominal muscles, 521; Physiological method of tendon, 620; Muscle, in shoulder girdle, 600; Correction of nasal deformities by, of bone, 618
- Transposition of viscera, Left sided appendicitis complicating, 494
- Transverse presentation, Spontaneous evolution of, 320
- Traumatic, Sarcomatous proliferation in, tumor, 173; sarcoma of femur, 389; aneurism of external iliac artery, 404; edema of hand, 608; separation of superior epiphysis of tibia, 500; spondylitis, 612
- Trauma, Effects of, upon urogenital tract, 444
- Trepanation, Fracture of base of skull; early double subtemporal, 304; Extraction of intracranial projectiles in two stages, for access after radiographic location, 501
- Trepising, Repair of skull after, 227
- Triangle of Petit in kidney surgery, 112
- Tringer finger, 618
- Triquetrum, Volar dislocation of semilunar bone with fracture sprain of os, 181
- Tubal pregnancy, Bilateral, 80; Double, 433; Diagnosis of, 57
- Tubercular, Surgical treatment of, ureter in female, 333
- Tuberculin as aid in surgical tuberculosis, 589
- Tuberculosis, Treatment of, diseases of spine, 373; Pro-liferating, cystitis, 300; Facial tumor as portal of entry in, cervical adenitis, 448; Treatment of, arthritis, 409; Periprosthetic abscess of, 01616, 547
- Tuberculosis, Bone and joint, 380; Treatment of, 203; Radiotherapy of, especially spina ventosa, 263
- Tuberculosis, Pulmonary, Artificial pneumothorax in treatment of, 560; Gunshot wounds of lungs and, 371; and sterilization, 420; and pregnancy, 642; Larynx in cases dying of, 650
- Tuberculosis, Renal, 431; Value of degeneration of leucocytes for quick diagnosis of genito-urinary, 59; End-results of, treated by nephrectomy, 432; Diagnosis, treatment and results of, 432
- Tuberculosis, Bone-graft for, of spine, 66; of urachus, 150; of patella, 175; of uterine appendages, 203; New growths of prostatic urethra in, 338; Primary, of prostate gland, 320; Surgical, of abdominal cavity, 372; Tuberculin as aid in surgical, 589; in its relation to eye diseases, 553; Early diagnosis of, of spine, 612
- Tubes, Abuses and dangers of drainage, 473
- Tubulization, Galalith in nerve, 617
- Tumors of cerebellum, Localization of, 150; Diagnosis of tumors in posterior cranial fossa, 170; Recovery after operation for, 151; Translabyrinthine operation for, and acoustic nerve, 478
- Tumors, Treatment of, Efficiency of Coolidge tube and rationale of radiotherapy in, 75; Operative, of testicle, 95; Removal of, of acoustic nerve through labyrinth, 216; Radium, 205; Operative, of bladder, 316; Diet and tumor growth, 401; Effect of roentgen rays on rate of growth of spontaneous tumors in mice, 406; Malignant tumors in and around orbit; starvation treatment, 443; Ultimate result of operation for Grawitz', 544
- Tumors, Sarcomatous proliferation in traumatic, 173; Myeloid, of tendon sheaths, 178; Melanogenic reaction in malignant, 193; Congenital dislocation of testis sheath in infant, 362; Origin of, in mice, 376; Coexistence of myoma and malignant, 331; of caecal body, 366; of parathyroids, 367; Bone dystrophies simulating, of bone, 388; of spinal cord treated with roentgen rays, 398; Origin of, in mice, 401; of ovary, 410; Bladder, in young, 435; Giant-cell, of tendon sheaths, 500; Irritation as malignant, development, 517; Action of autolysin on mouse, 527; Diagnosis of brain, 592; Origin of retroperitoneal cystic, 507; Malignant, of gall bladder, 600; Origin of, in mice, 618; Chemotherapeutic experiments on rat, 608
- Twilight sleep, 62
- Twins born, Third conservative cesarean section upon same woman operated at term in course of labor, 518
- Typhoid, perforation, 105, 160; Diagnosis of appendicitis in early, fever, 100; spine with autopsy findings, 184; Surgical complications of, 201; Facial abscess in pouch of Douglas following, 416; Acute, abdomen with surgical complications, 408
- Typhosa, Spondylitis, 612

- ULCERATION.** Posttyphoid, and structure of meso-
plegma, 483
- Ureter.** Cystitis, 169, 170; Essential factors in diagnosis of
chronic gastric and duodenal, 128; Gastric and
duodenal, 126; Pathogenesis of spontaneous and
experimental appendicitis of stomach and chole-
cystitis, 200; Clinical diagnosis of gastric, 178;
Surgical treatment of gastric, 180; Diagnosis of gas-
tric and duodenal, 100; Jejunal or duodenal, 101;
Tanner's, 617; Operative treatment of varicose veins
and, 643
- Umbilical hernia.** New operation for, 176
- Unilateral loma.** Operation for draining lachrymal sac and
nasal duct into, 117
- Urethra.** Tuberculosis of, 116
- Urea** as bactericide, 205
- Ureteral.** Post-operative, fistula, 145; Diagnosis of,
calculi, 117; Factors in diagnosis of renal and, calculus,
117, 144; Calculi, symptoms and treatment, 118
- Uretero-enteric anastomosis,** 113
- Ureteropyelitis.** Gonorrheal, 115
- Ureter.** Stone in kidney and, 110; Plastic surgery in kidney
pelvis and, 113; Surgical treatment of tubercular,
in female, 111; Carcinoma of, 640
- Urethral.** Recto-, anomaly, 127
- Urethra.** Complement deviation test as guide in infections
of, prostate and vesicle, 90; Destruction of obstructive
glandular growths in posterior, by high frequency
current, 128; Stricture, 115, 140; Varices of male, 126
- Urinary.** Formation of, calculi, 100, 110; Diagnosis of
chronic infections of, tract in women, 106, 110;
antiseptics, 141; Caudal anesthesia in genito-, surgery,
111; Experiences with Kistal-Mahone, test, 641
- Urine.** Nessler's test for blood in, 98
- Urogenital tract.** Effects of trauma upon, 442
- Uteri.** Change of cervix, 208
- Uterine.** Effect of some tonics on circulation, 731; fibroids
in production of sepsis, 84; X-ray treatment of, fi-
broids, 84; Choice between operation and roentgeniza-
tion of fibroids, 87; Complete intraplacental, rupture
during labor, 911; Essential, hemorrhage, 207; Treat-
ment of, hemorrhage by roentgen ray, 110; curette-
ment, 117; Value of heat in treatment of massive and
utterly inoperable, carcinoma, 610; displacements,
111; Mechanical aids to, displacements, 616
- Uterus.** Abnormal delivery from defective development of,
200; Morphine and scopolamine action upon intact,
118; Response of surviving, to morphine and scopo-
lamine, 118
- Uterus.** Cancer of, What do the newer methods of treat-
ment offer the patient with malignant disease of, 101;
High vs. low degrees of heat as palliative treatment
for advanced cases of, 101; Radium therapy in treat-
ment of, 101; Mesothorium treatment in, 111; Opera-
tions for, 100
- Uterus.** Carcinoma of, Radiotherapy of, and breast, 202;
Treatment of, with roentgen rays, 113; Heat in treat-
ment of, 110; High degrees of heat vs. low degrees of
heat as palliative treatment for advanced cases of, 110
- Uterus.** Displacements of, Emergency treatment of
ruptured, and ruptured ectopic pregnancy, 87; Spontaneous
rupture of, 207; Surgical treatment of ante-
rior, accompanied by irritation of bladder, dysmenor-
rhea, and sterility, 101; Ventilation of, for relief
of prolapse, 101; Surgical treatment of prolapse of,
110; Retroversion of, 116; Fixation of, and conse-
quences in obstetrics, 117; Prolapse of bladder and,
111; Prolapse of, 111; Transposition of bladder and,
for cure of cystocele and descensus uteri, 117; Retro-
displacements of, 116
- VACUUM** flushing leech, 648
- Vaginal.** Relaxed, urethra; its diagnosis and treatment,
17; Menstrual poisoning (from douche, etc., Advantages
of, section in pelvic surgery, 204; Rubeolose, varicose
in children, 110; Rectal as substitute for, examina-
tion in labor, 117
- Vagina.** Radium in treatment of carcinoma of cervix
uteri and, 101; Construction of artificial, with ensla-
vement of menstrual function, 104
- Vagotomus.** Attempts to produce experimentally condi-
tions of sympatheticotonia, and hyperthoradism,
111
- Varicos.** Operative treatment of indema and, of lower ex-
tremities due to thrombosis of femoral vein, 100; of
male urethra, 126
- Varicose.** Operative treatment of, veins and ulcers, 623;
Treatment of, leg ulcers, 624
- Vas** anastomosis, Epididymis, for sterility, 104
- Vas deferens.** Failure of union between, and testis, 126;
Surgery of, 116
- Vascular lesions.** Changes in visual fields as result of, in
brain and optic nerves, 144; produced by gunshot
injuries and their results, 624
- Vasomotor.** Condition of, center during development
of shock, 620
- Vasomotor.** Peripheral, changes in shock, 177
- Ventrilation** of uterus for relief of prolapse, 101
- Vertebra.** Results of excision of transverse process of fifth
lumbar, 174; Fracture dislocations of cervical, 100;
Congenital deformities of, and ribs, 110; Objective
symptoms of insufficiency of, 111; Fracture of, with-
out cord symptoms, 613
- Vesical.** symptoms in diagnosis of renal conditions, 110;
calculi in children, 126; Significance of, symptoms in
diagnosis of renal conditions, 144; Treatment of,
calculi, 114
- Vesicovaginal fistula.** Repair of small, 205
- Vesiculectomy.** Vesiculectomy and, 652
- Vesiculectomy** and vesiculectomy, 652
- Vessels.** Irregular kidney, 111
- Visceral ptosis** cured by Rovsing's operation, 100
- Visceropneumonia.** Clinical aspects of, 111; Preliminary note
on treatment of, 110; In women, 610
- Viscera.** Left-sided appendicitis complicating transposition
of, 104
- Visual fields.** Changes in, as result of vascular lesions in
brain and optic nerves, 144
- Von Jaksch's anemia.** Splenectomy for, 108
- WAR** injuries, Early disinfection of, 70; Surgery in, of
nervous system, 100; Resection of elbow for aneurysm
from, 104; Radiotherapy in psastic affections of spinal
cord from, 108; Radiotherapy of, 100; of eye, 144;
Infectious complications of, 111; Gas phlegmons in,
111; General rules for immediate treatment of, in an
ambulance at the front, 100
- War.** Injuries of spinal cord in, 70; Operative treatment of
abdominal wounds in, 70; Lumbar puncture in nervous
shock and wounds of skull in, 77; Hospital experience
in Turko-Bulgarian, 111; aneurysms, 104; Neurology in,
104; Treatment of injuries of peripheral nerves dur-
ing, 111; Early sterilization of, wounds with hot
air or oxygen, 101; Improvised devices for, surgery,
101; in regard to organization of medical service, 104;
Injuries of kidney in, 117; Lesions of membranes of
eye in, with eyeball intact, 110; Treatment of wounds
in, 107; Effects of asphyxiating, gases, 111; Fate of
one wounded in test, 111; Treatment of wounds in,
110; orthopneumia, 100; Treatment of skull wounds in,
108; Medico-military notes from Belgium, zone, 620

Wax tip, New method of passing, 212
 Wounded, Chest complications among, 368, Preservation of hand, 389
 Wounds of abdomen, Penetrating, treated at front, 76; Operative treatment of, in war, 76; Operative indications in penetrating, 597; Why, how, and where to intervene in, 597
 Wounds, Treatment of, Abortive, 74; Use of antiseptic substances in, 74; Wound infections and, 197; of thorax, 248, with Delbet's solution, 287; of tangential wounds of skull, 286; Immediate treatment of penetrating skull, 591; Treatment of traumatic aneurisms resulting from bullet, 288; Character of, in war, 290; Treatment of septic, in war by magnesium sulphate solution, 291; Standardized, 361; Treatment of, in war, 407; Quantitative analysis of influence of size of defect on, healing in skin of guinea pig, 473; Chloramine in treatment of, of mouth and jaws, 477; General, 526; Disinfection and immediate or early reunion of recent, 588; Incised, of heart, 596; Physiological treatment of bullet and shell, of peripheral nerves, 615

Wounds, English bullet, action of regular infantry bullet and dum-dum bullet, 77; Bacteriology of septic, 286; Penetrating chest, 288; Penetrating, of thorax, 190; Gunshot, of abdomen in field, 372; Etiology of post-operative or, scarlet fever, 474; Hopeless prognosis of gastro-intestinal, without operation, 485

X-RADIATION, Biological explanation of, effect, 496
 X-ray, Limitation of, diagnosis of bone and joint diseases, 172; Sonostometry, 192; Protective devices for operators, 192; detector for removal of foreign bodies in tissues, 193; Localization of foreign bodies by, 193; Sarcoma of upper jaw symptomatically cured by, 246; Kidney lesions diagnosed with aid of cystoscope and, 432; Value of, in diagnosis of gastro-intestinal disturbances, 254; New therapeutic, localizer, 282; Anomalies of sacro-iliac region in, picture, 311; treatment of uterine fibroids, 84; treatment of fungating epithelioma with progressive filtration, 192; treatment of ringworm of scalp, 246

X-ray: See also Roentgen, Radium, Fluorescent, and Foreign bodies

INDEX OF BIBLIOGRAPHY

GENERAL SURGERY

Surgical Technique

- Operative Surgery and Technique, 104, 106, 336, 337, 356, 365
 Aspic and Anthesia: Surgery, 334, 351, 353, 363
 Amputation, 104, 106, 334, 335, 353, 363
 General. Local. General subjects on amputations
 Surgical Instruments and Apparatus, 104, 109, 334, 335, 353, 363

Surgery of the Head and Neck

- Head, 104, 310, 334, 335, 354, 365
 Scalp. Skin. Nerves. Glands. Skull and
 Maxilla. Meninges. Brain, cerebrium, cere-
 bellum, hippocampus
 Neck, 104, 334, 335, 336, 353, 365
 Skin. Glands. Muscles and blood vessels.
 Bones. Thyroid Gland, Basedow's disease,
 Graves' disease. Parathyroid. Retropharyn-
 geal conditions

Surgery of the Chest

- Chest Wall and Breast, 105, 106, 335, 353, 363, 367
 Breast. Incisions, wounds, injuries, etc. Bones.
 Pleura. Mediastinum. Thyroid
 Trachea and Lungs, 105, 106, 335, 353, 363, 367
 Trachea. Bronchi. Lungs
 Heart and Vascular System, 105, 111, 336, 353, 365, 367
 Heart. Pericardium. Aorta
 Pharynx and Oesophagus, 336, 353, 365

Surgery of the Abdomen

- Abdominal Wall and Peritoneum, 105, 111, 336, 353, 363, 367
 Incisions and drainage. Tumors. Retro- and pre-peritoneal conditions. Peritoneum. Dia-
 phragm. Hernia. Omentum. Mesentery.
 Cecum. Diverticula
 Gastro-Intestinal Tract, 105, 111, 336, 353, 363, 367
 Stomach and pylorus. Duodenum. Small in-
 testines. Cecum. Appendix. Colon. Rectum.
 Anus
 Sections of, diagnosis, radiology, injuries,
 hemorrhages, vomiting, inflammations, ob-
 structions, hernia, ulcer, tumor, surgery,
 general therapy
 Liver, Gallbladder, and Spleen, 105, 111, 336, 353, 363, 367
 Miscellaneous, 105, 111, 336, 353, 363

Surgery of the Extremities

- Diseases of Bones, Joints, Muscles, Tendons. General
 Conditions Commonly Found in the Extremities,
 107, 113, 338, 353, 368, 369
 Fractures and Dislocations, 107, 114, 339, 356, 368, 369

- Surgery of the Bones, Joints, etc., 108, 114, 339, 356, 368, 369
 Orthopedics in general, 108, 113, 340, 356, 368, 369

Surgery of the Spinal Column and Cord

- Diseases and Deformities of the Spine, 108, 114, 340, 357, 370, 370
 Inflammations, tumors, fractures, surgery.
 Cord

Surgery of the Nervous System

- Nervous System, 109, 113, 340, 357, 370, 371
 Inflammations, tumors, surgery

Surgery of the Skin, Fascia, Appendages

- Skin, Fascia, and Appendages, 109, 113, 341, 357
 Burns, injuries, inflammations, tumors, ulcers,
 surgery

Miscellaneous

- Clinical Entities—Tumors, Cysts, Abscesses, etc.,
 109, 113, 341, 357, 370, 371
 Tumors. Ulcers. Inflammations. Shock.
 Tissue transplantation. Surgical diseases
 Sera, Vaccines, and Ferments, 110, 115, 341, 358, 371, 372
 Serum. Vaccine. Ferments. Immunization.
 Anaphylaxis
 Blood, 110, 115, 341, 358, 371, 372
 Blood picture in general. Hemorrhage. Coagu-
 lation. Thrombosis. Embolism. Transfusion
 Blood and Lymph Vessels, 110, 115, 341, 358, 371, 372
 Aneurisms. Vessel suture and ligation. Lymph-
 vessels and glands
 Poisons, 110, 115, 341, 358, 371, 372
 Bacterial. Chemical
 Surgical Therapeutics, 110, 116, 341, 358, 372
 Surgical Anatomy, 373, 373
 Radiology, 110, 117, 343, 358, 374, 375
 X-ray. Electrical treatment and injuries.
 Heliotherapy
 Surgical Diagnosis, 117, 359, 375, 375
 Military Surgery, 111, 117, 343, 340, 375, 375
 Medical, Hospital, and Medical Education, 110, 374, 374

GYNECOLOGY

- Uterus, 111, 118, 344, 360, 374, 375
 Tumors. Hemorrhage. Inflammations. Mal-
 formations. Displacements. Injuries. Surgery
 Adrenal and Peritoneal Conditions, 113, 118, 344, 360, 374, 375
 Ovaries. Tubes. Ligaments. Pelvic conditions
 in general
 External Genitalia, 113, 118, 345, 360, 374, 375
 Vagina. Vulva. Urethra. Clitoris
 Miscellaneous, 110, 345, 360, 374, 375

OBSTETRICS

- Pregnancy and Its Complications, 113, 289, 345, 468, 671, 672
 Pregnancy, Eclampsia and toxæmia, Cesarean section, Abortion, Complications
 Labor and Its Complications, 113, 330, 343, 461, 575, 676
 Contracted pelvis, Abnormal presentations, Dystochia, Hemorrhage, Surgical treatment
 Puerperium and Its Complications, 113, 238, 343, 461, 575, 676
 Diseases common to, Infections, Hemorrhages
 Miscellaneous, 114, 238, 345, 461, 576, 676

GENITO-URINARY SURGERY

- Adrenal, Kidney, and Ureter, 114, 238, 346, 461, 576, 677
 Adrenal gland, Kidneys, Ureters
 Trauma, calculi, displacement, malformation, hemorrhage, tumors, inflammations, surgery, functional tests of

- Bladder, Urethra, Penis, 114, 238, 346, 461, 576, 677
 Trauma, calculi, displacement, malformation, hemorrhage, tumors, inflammations, surgery
 General Organs, 114, 231, 347, 461, 577, 677
 Testicle, Epididymis, Spermatic cord, Prostate
 Miscellaneous, 115, 231, 347, 461, 577, 678

SURGERY OF THE EYE AND EAR

- Eye, 111, 231, 347, 461, 577, 678
 Glaucoma, Trachoma, Cataract, Inflammations
 Ear, 115, 232, 348, 461, 578, 679
 Outer ear, Middle ear, Internal ear, Mastoids, Brain abscess of otitic origin, etc.

SURGERY OF THE NOSE, THROAT, AND MOUTH

- Nose, Throat, and Mouth (oral surgery) 115, 232, 348, 461, 578, 679
 Nose: external, internal
 Throat: tonsils, adenoids, larynx, pharynx
 Mouth: palate, cleft palate, teeth, tongue
 General conditions

INDEX OF AUTHORS

- Aaron, C. D., 193
 Abadie, 203
 Abbott, A. W., 193
 Adamantine, H., 488
 Albert, H., 102
 Alder, A., 31
 Alexander, G. J., 662
 Allen, E. S., 443
 Allen, H. R., 179
 Allison, N., 172
 Allport, F., 555
 Andrews, E., 73
 Anderson, H. B., 108
 Anderson, A. H., 550
 Andrews, B. F., 332
 Angelson, N., 171
 Anson, G., 271
 Arnold, J. O., 202
 Ashcroft, L. I., 99, 631
 Ashhurst, A. P. C., 182
 Aubineau, E., 111
 Aubourg, 113
 Auerbach, S., 616
 Austin, A. E., 488
 Ayland, L. E., 97

 Babcock, W. W., 170
 Baetjer, P. H., 254
 Bailey, F. W., 167
 Bailey, H., 658
 Bainbridge, W. S., 164, 604
 Balch, K., 415
 Balcarak, A., 403
 Ballmer, D. C., 464, 519
 Ballantyne, J. W., 644
 Bane, W. C., 215
 Bardsley, R., 247
 Barber, W. H., 125
 Barbour, H. G., 418
 Barclay, H., 115
 Barclay, P., 298
 Barnes, F. R., 201
 Barnes, H. A., 448
 Barnes, R. H., 262
 Barnett, C. E., 37, 439
 Barrett, 523
 Bartels, L., 111
 Barwell, H., 660
 Beach, S., 600
 Bainger, H. R., 501
 Batten, F. E., 64
 Baulet, R., 202
 Baumel, J., 77
 Beach, R. M., 202
 Beaton, H., Jr., 146
 Beber, E. L., 206, 207
 Beebe, H. M., 200
 Beck, E. G., 100
 Beckman, E. H., 200
 Beckie, G. A., 204
 Beckman, F., 200
 Beer, E., 201
 Beltner, F. V., 187
 Bellot, 106
 Bellet, J., 203
 Bellamy, P. A., 184
 Bennett, V. B., 444
 Benneche, M., 115, 493
 Benthin, W., 90
 Bernard, L., 116, 162, 188
 Bergoin, O., 60
 Beryl, S., 188
 Bergund, J., 528
 Bernart, W. F., 214
 Bernstein, H. A., 87
 Besley, F. A., 474
 Betts, N. S., 475
 Beuren, F. L. Van, Jr., 384, 515
 Bevan, A. D., 143
 Beyer, H. L., 185
 Bier, A., 194
 Bismarck, 610
 Birkbeck, L. H. C., 154
 Bishop, E. S., 518
 Bishop, H. D., 645
 Binell, D., 225
 Bittorf, A., 67
 Bittrol, 514
 Black, J. C., 169
 Black, J. E., 617
 Blake, J. B., 171
 Blanchard, W., 303
 Brand, P. B., 89
 Brand Sutton, J., 601
 Brandt, R. W., 101
 Bresser, F., 110
 Brock, F. B., 618
 Brookgood, J. C., 504
 Brum, S., 311
 Brumenthal, G., 71
 Brumenthal, N., 71
 Boardman, W. W., 61
 Bous, T., 497
 Bouchier, 485
 Buggs, R. H., 626
 Bodd, H. J., 201, 204, 530, 531
 Bonney, C. W., 97, 476
 Bonney, V., 420
 Bonnet, E., 88
 Bonson, G., 208
 Bookman, M. R., 506
 Booth, L. S., 262
 Bouchard, M., 66
 Bouchier, E., 268
 Boulton, G. C., 182, 601
 Bowen, J. T., 201
 Bowyer, L. G., 147
 Boyd, F. D., 616
 Boyd, M. L., 115, 118
 Bransch, W. F., 116, 118, 120, 144, 549
 Bradford, J. R., 200
 Bradner, M. R., 277
 Brandes, M., 611
 Brasseur, L. W., 442
 Brand, L. D., 213
 Branderbrenner, J., 190, 205, 278
 Brinks, C. M., 530
 Brown, C. P., 21
 Brown, R. H., 655
 Brown, W. I., 51, 641
 Brown, W. M., 200, 206
 Browning, A. W., 425
 Bruce, W. L., 191
 Bruckner, A. J., 115
 Brum, W. von, 248
 Bruns, L., 202
 Brunel, H. F., 286
 Bryan, R. C., 429
 Bubb, J. L., 424
 Buchanan, J. J., 170
 Buel, S. W., 99
 Burger, L., 72, 104
 Buergi, E., 74
 Buiss, P., 110
 Bueckhardt, H., 153, 278, 609
 Burke, C. B., 180
 Burmeister, W. H., 520
 Burnam, C. F., 298
 Burnett, S. G., 518
 Burnham, A. C., 189
 Byford, H. T., 187

 Cabot, H., 117, 110, 544
 Calderon, F., 542
 Caldwell, C. E., 179
 Callot, 523
 Campiche, P. S., 651
 Capelle, 497
 Carles, J., 195
 Carman, R. D., 255, 262
 Carpenter, F. W., 661
 Carrel, A., 74
 Carter, P. J., 91
 Carter, W. W., 658
 Cartledge, E. C., 427
 Cary, E. H., 443
 Catton, J. H., 650
 Catfield, A. St. G., 262
 Cernie, M., 189
 Challant, S. A., 303
 Chapman, V. A., 478
 Chaquet, H., 188
 Charlier, A., 195
 Chauvin, E., 602
 Chavasse, A., 265
 Chiari, O., 54
 Child, C. G., 517
 Chishman, J. W., 174
 Chute, A. T., 216
 Chute, P., 608
 Clagett, A. N., 416
 Clark, J. G., 202
 Clark, S. M. D., 209
 Clarke, E., 535
 Clay, J. V. F., 116, 511
 Clendenen, L., 173, 542
 Cleveland, A. J., 420
 Clements, H., 392
 Clinton, M., 404
 Coffin, L. A., 447
 Cole, H. P., 112, 142, 112, 419, 595
 Cole, L. G., 192, 181
 Coleman, W. J., 206
 Coley, W. B., 479
 Colston, J. A. C., 629
 Contand, 606
 Cook, A. G., 205
 Conley, F. L., 108
 Copeland, G. C., 89, 509
 Copello, O., 187
 Copenhaver, N. H., 418
 Corbett, J. F., 212, 277
 Corner, G. W., 510
 Corcoran, J. A., 510
 Cotton, A., 179
 Cotton, F. J., 449, 399
 Crabtree, E. G., 410
 Craig, L., 94
 Crawford, A. C., 479
 Crile, G. W., 69, 258
 Crieley, J. A., 374
 Crisley, R. H., 95
 Cronin, J. J., 661
 Cropper, J. W., 519
 Crothwait, W. L., 642
 Crouse, H., 212
 Cullen, T. S., 542
 Culver, H. B., 502
 Cumston, C. G., 98
 Cuno, B., 588, 589
 Cunningham, J. H., Jr., 458
 Curdy, R. J., 556
 Curtis, A. H., 206, 550
 Cuthbertson, W., 84
 Cutter, I. S., 641

 Da Costa, J. C., 60, 512
 D'Agata, G., 607
 Dackie, H. D., 74
 Dandrea, 74
 Davidson, A. J., 115, 510
 Davis, B. F., 424
 Davis, C. H., 65
 Davis, E. D., 477
 Davis, J. D. S., 156
 Davidson, C., 62, 180
 Day, E. W., 446
 Day, R. V., 528
 Dayton, H., 14
 Dearborn, F. M., 120
 Deaver, J. B., 115, 186
 Degraff, P., 208
 Dehelly, 74
 Dejerine, 616
 Delavan, D. B., 561

- Delbet, P., 504, 588, 612, 613
 De Lee, J. B., 517
 Delorme, 309
 Demachara, C., 430
 Demich, E. B., 531
 DePage, A., 610
 Demoux, M., 417
 Devor, F. J., 254
 Dierfler, H., 574
 Dubanore, W. H., 477
 D'Orla, G., 280
 Dowd, C. N., 566, 593
 Downey, J. R., Jr., 446
 Drew, A. H., 519
 Dunne, A., 552
 DuBoise, F. G., 376
 Dufin, J., 189
 Duffy, G. V., 256
 Dumas, 74
 Dumas, R., 617
 Duncan, C. H., 105
 Duplap, E., 618
 Dupreac, 501
 Duval, P., 251
 Dwight, K., 391

 Earl, 603
 Earley, T. B., 512
 Eastman, J. R., 54, 156, 391
 Edward, M. L., 428
 Ehrenfest, H., 211
 Erendrath, D. N., 647
 Elliott, J. B., Jr., 384
 Elliott, T. R., 300
 Ellis, J. W., 380
 Ellis, T. L., 372
 Elmsler, L., 397
 Els, 511
 Elberg, C. A., 168
 Elie, J. E., 606
 Emerson, W. R. P., 216
 Enderlen, 76
 Engelmann, G., 611, 613
 Englander, S., 551
 Estes, W. L., 181
 Estor, E., 247
 Euterman, G. B., 158
 Evans, C. A., 363
 Eyles, F., 392

 Faber, H. K., 490
 Fabbro, 391
 Fairfield, W. E., 370
 Falk, H. C., 481
 Fassett, F. J., 274
 Fauntleroy, A. M., 407, 504
 Fearnside, E. G., 510
 Feiss, H. O., 480
 Feldmann, L., 262
 Fellenberg, R., von, 505
 Fenion, R. A., 115
 Ferrand, J., 274
 Ferraton, 411
 Fetterolf, G., 659
 Field, T. S., 416
 Figueiredo, J. P. de, 303
 Finkelborg, 389
 Finkelstone, B. B., 172
 Finney, J. M. T., 162
 Finischetto, E., 380
 Finstener, 502
 Fischer, H., 243
 Fischer, L., 361
 Fisher, A. R., 477
 Fitzsimmons, H. J., 184
 Flaming, A., 280
 Fletcher, E. A., 432
 Flint, E. K., 178
 Fols, C., 616
 Fonin, A., 588
 Forgue, E., 602
 Fort, F. T., 367
 Foukett, E., 203
 Foster, G. S., 181
 Fowler, C. C., 157
 Fowler, R. H., 207, 604
 Fraenkel, S., 402
 Frangenheim, P., 273
 Frank, J., 303, 575
 Frank, R. T., 85, 430
 Franque, von, 410
 Fraser, J., 522
 Fraser, J. S., 331, 444, 661
 Frauenthal, H. W., 273
 Freeland, J. R., 210
 Freeman, J. K., 480
 Freeman, L., 481, 480
 Freer, O. T., 447
 Friedberg, S. A., 55
 Friesenwald, J., 162, 254, 600
 Frieder, W., 175, 607
 Frisch, O. von, 269
 Fruehwald, V., 370
 Fuerer, E., 402
 Fullerton, A., 437
 Funk, E. H., 60
 Funk, V. A., 372
 Furniss, H. D., 245

 Gale, S. S., 376
 Galli, G., 612
 Gallie, W. E., 183, 505
 Galloway, D. H., 423
 Gamble, H. A., 517
 Gangolphe, M., 266
 Gansen, M., 611
 Gardiner, H., 217
 Gardner, J. A., 326
 Gardner, W. S., 203
 Garnier, P., 265
 Gatewood, 484
 Gayet, G., 363
 Geist, S. H., 202
 Gelpi, P. J., 328
 Gemmill, W., 61
 Geraghty, J. T., 414
 Gerding, L., 483
 Gerhardt, D., 370
 Gerlanus, M., 609
 Gibbon, J. H., 165, 260
 Gilbert, J., 393
 Giles, G. M., 391
 Gilles, R., 538
 Gillette, W. J., 516
 Gilpin, S. F., 512
 Gruffield, F. J., 426
 Glénard, R., 570
 Glenn, E., 627
 Goddard, H. M., 550
 Goldberg, B., 115
 Goldberg, S., 302
 Goria, 586
 Gout, O., 508
 Gouverneur, R., 404
 Graff, 266
 Graham, C., 256
 Grangée, 426
 Gratzl, F., 185
 Gray, H. M. W., 154, 526
 Greenough, R. B., 501
 Greig, D. M., 262
 Grey, E. C., 190
 Griffith, F. W., 639
 Grosse, 67, 538
 Grossman, J., 501
 Gruenhagen, E., 314
 Gruter, O. C., 517
 Guleke, 52
 Gwathmey, L., 263

 Hadley, M. N., 507
 Haggard, W. D., 455
 Haines, T. H., 551
 Haines, W. D., 87
 Halpenny, J., 309
 Halsted, W. S., 152
 Hamant, A., 498, 608
 Hamer, H. G., 545
 Hammond, R., 176
 Handley, W. S., 250
 Hans, H., 508
 Harman, N. B., 646
 Harper, F. A., 636
 Harper, P. T., 540
 Harry, C. R., 440
 Hart, D. B., 541
 Hartman, W. L., 306
 Hartwell, J. B., 612
 Hartzell, T. B., 175, 663
 Hauser, 203
 Hawk, P. B., 60, 157
 Hawley, G. W., 307
 Hayes, W. B., 302
 Haynes, I. S., 400
 Hays, G. L., 507
 Head, G. D., 252
 Hegner, 444
 Hegner, C. F., 186
 Heilbron, L. G., 285
 Heimann, F., 283
 Heineberg, A., 537
 Heitger, J. D., 650
 Hoffman, A. M., 402
 Henderson, M. S., 175, 182
 Hendrick, A. C., 411
 Henrici, A. T., 663
 Hercher, F., 277
 Herman, N. B., 475
 Herzfeld, E., 70
 Hibbs, R. S., 269
 Higgins, W. H., 267
 Hinman, F., 95, 317, 441
 Hirschfelder, J. O., 403
 Hirschman, L. J., 169
 Hirst, J. C., 643
 Hodgson, F. G., 510
 Hoffman, C. S., 182
 Hoffman, F. L., 618
 Hoffman, L. H., 203
 Hofmeister, J. A., 167
 Hoke, M., 64
 Holcomb, R. C., 123
 Hulten, G. R., 87
 Holmes, G., 287
 Holmes, R. W., 426, 427
 Holt, O. P., 516
 Homana, J., 623
 Hooker, R. S., 622
 Horn, 76
 Horn, H. W., 171
 Hornstein, M., 91
 Horsley, J. S., 146, 561
 Howat, R. K., 643
 Hubeny, M. J., 246
 Huber, F., 436
 Huber, O., 265
 Hudson-MacKen, G., 218
 Huemey, P., 474
 Hunt, C. S., 362
 Huntington, T. W., 178
 Hurd, L. M., 440
 Hvitte, 523
 Hyzer, H., 652

 Illig, H., 554
 Imperatori, C. J., 660
 Ingebrigtsen, R., 614
 Ingram, L. C., 332
 Iselin, H., 284
 Israel, S., 561
 Ivy, R. H., 562

 Jackson, D. E., 143
 Jacobaeus, H. C., 249
 Jacobson, J. H., 253, 500
 Jaeger, C. H., 505
 Jefferson, G., 264
 Jansen, T. H., 612
 Jardine, R., 643
 Jeger, E., 247, 270, 292, 604
 Jerusalem, M., 278
 Johns, S. M., 170
 Johnson, 521
 Johnson, G. C., 626
 Joly, J. S., 436
 Jones, C. R., 600
 Jones, E., 538
 Jones, F. S., 610
 Jones, F. W., 327
 Jones, J. F. X., 617
 Jordan, A. C., 282
 Joseph, D. R., 620
 Judd, A. M., 620
 Judd, E. S., 293, 377
 Judson, A. B., 610
 Jung, E., 56

 Kaempler, L. G., 312
 Kahn, A., 73
 Kahn, J. V., 647
 Kahn, M., 621
 Kaiser, F. J., 524
 Kalit, 334
 Kaminer, S., 153
 Katzenstein, M., 397

- Pierre, F. A., 422
 Pike, F. H., 516
 Pinard, A., 184
 Pitres, A., 400
 Planchin, 518
 Planchon, L., 190, 323
 Plonkin, T., 98
 Polak, J. O., 62
 Pool, L. H., 154, 481, 498
 Pope, C., 275
 Pope, S. T., 623
 Popper, H., 191
 Porter, L., 131
 Portucallos, A., 621
 Pouch, W. C., 444
 Post, A., 190
 Powers, C. A., 368
 Proun, J., 664
 Price, J. W., 405
 Price, N. G., 309
 Primrose, A., 407
 Prochownik, L., 88
 Pryor, J. H., 482

 Quénou, E., 55, 253, 288, 378, 602
 Quinby, W. C., 431

 Ramirez, M. A., 154
 Rand, C. W., 174
 Randall, A., 547
 Ramondoff, J., 304
 Ramel, E., 51
 Ratterman, H. T., 516
 Read, J. S., 479
 Reiter, F., 484, 540
 Reid, R. J., 197
 Reibess, M. E., 157
 Reich, 274
 Reilly, T. F., 519
 Reimann, S. P., 277
 Remet, J., 146
 Remond, E., 170
 Remsen, C. M., 180, 364, 486
 Reverchon, H. L., 201
 Reynolds, E., 313
 Rhein, M. L., 664
 Rhodes, G. B., 371
 Rildart, H., 96
 Richards, A., 406
 Richards, O., 389
 Richardson, M. L., 151
 Rilynath, R. F., 558
 Riedel, 161
 Rieder, H., 171
 Rissman, D., 554
 Risher, E. H., 175, 520
 Ritzi, A., 597
 Ruhn, G., 365
 Roberts, J. B., 269, 474
 Roberts, J. E. H., 148
 Roberts, P. W., 613
 Roberts, W. O., 434
 Robertson, J. F., 86
 Robitshek, E. C., 440
 Rockey, A. E., 810
 Rockwell, O. H., 184
 Rothenburg, G. L., 517
 Robison, H. D., 365

 Rollet, F., 310
 Roney, A. J., 52
 Rooley, B. M., 451
 Rosenberger, R. C., 617
 Rosenblum, J., 420
 Rosinow, E. C., 260
 Ross, L. F., 147
 Rosier, G., 417
 Rost, W. L., 171
 Rothschild, C. J., 92
 Roux, 500
 Roux, J., 494
 Rugh, J. T., 184
 Rula, J., 598
 Runge, E., 114
 Rupert, R. R., 321
 Ruse, S., 192
 Russell, C. W., 166
 Ruth, C. E., 389

 Sachs, E., 164
 Sachs, T. B., 369
 Sackur, 524
 Saenger, 398
 St. Clair, R., 285
 Saint-Martin, 555
 Sampson, J. A., 635
 Sanes, K. L., 534
 Sanford, A. H., 664
 Sanger, F. D., 560
 Sargent, P., 287
 Satterlee, H. S., 622
 Sauerbroch, 76
 Savariaud, 390
 Saxl, A., 611
 Schaefer, A., 384
 Schanz, A., 511
 Schatz, F., 426
 Schaffbauer, H. E., 615
 Schiller, A. N., 655
 Schlagenhauser, 367
 Schlesinger, M. J., 190, 210
 Schlitowsky, M., 265
 Schlossingk, K. E., 313
 Schlossmann, 501
 Schlow, O. M., 479
 Schmeisser, H. C., 498
 Schmerz, H., 269
 Schmidt, L. E., 433, 652, 653
 Schmiegelow, E., 216
 Schmitt, A. H., 420
 Schmitz, H., 300
 Schoemaker, J., 495
 Schoenbeck, O., 509
 Schreiber, L., 443
 Schreyer, 208
 Schroeder, H., 287
 Schroeder, L. C., 479
 Schrup, J. H., 168
 Schumann, E. A., 427
 Schneider, C. L., 61, 263
 Seaborn, E., 62
 Seelig, M. G., 620
 Sehr, E., 527
 Selzer, H., 159
 Senear, F. E., 298
 Seyer, J. W., 176
 Sewell, D. L., 111
 Shambaugh, G. E., 101

 Shastly, J. H., 193
 Sherr, O. M., 177
 Sherman, W. O., 261, 397
 Shlenker, M. A., 200
 Shropshire, C. W., 413
 Sicard, J. A., 275
 Sick, C., 173
 Simmons, M., 592
 Simons, L., 199
 Simpson, F. F., 79
 Simpson, J. H., 560
 Skillern, P. G., Jr., 179, 623
 Skillern, R. H., 662
 Skinner, E. H., 69
 Slemons, J. M., 315
 Sloan, H. G., 541
 Slocum, M. A., 591
 Slyke, D. D. Van, 72
 Smead, L. F., 332
 Smith, E. A., 657
 Smith, E. O., 319
 Smith, E. W., 93
 Smith, F. D., 62
 Smith, H., 533
 Smithies, F., 255, 492
 Smythe, F. D., 165
 Snow, I. M., 252
 Solenberger, A. R., 193
 Solomon, E. P., 502
 Soudyren, 407
 Soule, R. E., 65
 Souttar, H. S., 512
 Spain, K. C., 473
 Spaulding, C. B., 207, 550, 637
 Spaulding, E. R., 536
 Spelman, J. D., 629
 Sprunt, T. P., 171
 Squier, J. B., 322
 Stanton, W., 430
 Stargardt, K., 77
 Stark, H. H., 443
 Steiger, M., 413
 Stein, A., 641
 Steineller, A., 183
 Steiner, H., 71
 Steinke, C. R., 269
 Stephenson, H. A., 209
 Stern, S., 84
 Stewart, 150
 Stewart, G. D., 450
 Stewart, M. J., 178
 Stewart, W. H., 441
 Sticker, A., 193
 Stieren, E., 191
 Stoddard, J. M., 91
 Stoffel, A., 68
 Stokes, A. C., 651
 Stoller, H., 265
 Stone, C. A., 64
 Strauss, A., 39, 256, 494
 Stammeyer, K., 608
 Sturges, M. G., 193
 Stürmberg, A., 532
 Sullivan, A., 191
 Sullivan, J. J., 193
 Suzuki, K., 183
 Sweet, J. E., 286
 Swift, W. B., 333

 Symons, W. M. C., 495
 Symson, E. M., 62

 Taboulet, G. G., 121
 Tanton, T., 609
 Tardis, 76
 Tashir, H., 422
 Taylor, H. C., 203
 Taylor, H. L., 175, 607
 Taylor, J. H., 477
 Taylor, K., 366
 Tennant, C. E., 186
 Terrien, F., 554
 Teutschlaender, O., 492
 Thiemann, H., 616
 Thiele, 113
 Thomas, G. J., 429
 Thomas, H. B., 173
 Tinker, M. B., 489
 Tinsend, G., 597
 Tomlin, W. S., 445
 Tonga, Y., 258, 272
 Torrance, G., 56
 Tourneur, J. P., 652
 Treher, H., 202, 284
 Troell, A., 489, 512, 607
 Truesdale, P. E., 59
 Tuller, T., 67, 79, 397
 Tugman, O., 192
 Tullach, W. J., 291
 Turner, G. G., 473
 Turner, H., 184
 Tuttle, E. G., 302

 Udaondo, C. B., 378
 Ugas, R., 189
 Ullmann, E., 395
 Ulrich, H. L., 311

 Vail, D. T., 655
 Valade, E., 315
 Van Cappellen, 640
 Van de Velde, T. H., 399
 Varay, F., 490
 Vassier, 291
 Vaughan, G. T., 406
 Velter, M. E., 391
 Venable, C. S., 495
 Verhaeghe, 602
 Verhoed, F. H., 335
 Vignat, P., 597
 Vignat, 391
 Vincent, B., 301
 Vineberg, H. N., 418
 Vinson, J. C., 98
 Volsky, A. P., 391
 Volkmann, J., 371

 Wachtel, H., 208
 Wagner, K., 173
 Wahl, H. R., 268
 Waldron, C. W., 277
 Walker, R. C., 299
 Wallace, C., 286
 Waller, C. C., 383
 Walscheld, A. J., 380
 Walthier, C., 69
 Walther, H. W. E., 129
 Walton, A. J., 98, 281
 Ward, G. G., Jr., 124

- Ward, W. D., 304
 Warren, C. C., 411
 Warner, J. W., 415
 Warren, R., 179
 Warren, S. A., 344
 Warren, S. P., 111
 Watanabe, W. K., 479
 Watkins, T. J., 86, 171, 311
 Watson, C. H., 415
 Watt, C. H., 31
 Watherson, C., 434
 Weber, E., 32
 Wed, R., 605
 Weiland, W., 275
 Weissberg, T. H., 130
 Weiss, E. A., 190
 Weiss, H., 338
 Wellborn, J. Y., 121
 Wells, C. F., 351
 Wendt, 611
 Werner, P., 306, 308
 West, H., 111
 Wetherill, H. G., 302
 White, H. S., 647
 Whitford, C. H., 426
 Whitford, G. S., 420
 Whitmore, W., 141
 Wiener, J., 114
 Wilson, D. G., 155
 Wilson, H. B., 411
 Wilder, R. M., 325
 Wile, U. J., 298
 Willard, D., 181
 Willard, W. P., 610
 Williams, B. G. R., 100
 Williams, J. T., 454
 Williams, J. W., 111
 Williams, R. B., 165, 603
 Williamson, T. V., 99
 Willis, B. C., 54, 448
 Wilms, 286, 400
 Wilson, J. C., 80
 Wilson, J. G., 448, 526
 Wilson, L. B., 438
 Windsor, J. T., 91
 Winn, D. F., 137
 Winslow, J. R., 447
 Winslow, R., 160
 Winter, G., 401
 Winta, H., 281
 Wisbart, D. J. G., 118
 Wising, O., 101
 Wissel, O., 269, 610
 Wigham, W. H., 404, 619
 Wiskart, A. L., 114
 Wiskart, W. E., 310
 Willems, J. L., 441
 Wolfmann, H., 403
 Wood, F. C., 117
 Wood-Comstock, B., 619
 Woodruff, S. R., 448
 Woods, R. H., 160
 Woolley, P. G., 411
 Work, P., 120
 Wurms, G., 408, 409
 Worth, A. C., 154
 Woulfe, C. T., 101
 Wright, A. E., 197
 Yankauer, S., 111
 Yates, W. N., 482
 Young, W. G., 609
 Zahradnický, F., 61, 13, 269
 Zander, 381
 Zange, 478
 Zimmerman, B. F., 606
 Zobel, A. J., 418
 Zoppetta, H., 254
 Zondek, H., 111
 Zuckerkandl, O., 310
 Zuehlke, E., 177
 Zuehlke, J. D., 191

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COLLECTIVE REVIEW

BONE-GRAFTING

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AS the result of long animal experimentation and experiments on human beings, the best and most successful method of transplanting bone seems generally agreed upon by almost everyone to be as follows:

The graft should be living, free or pedunculated, with as much periosteum covering as possible, and also containing endosteum and marrow, and the graft should be autogenous; that is, taken from the patient who is to be grafted. It seems certain that if a graft be made according to these rules nothing further is necessary to ensure success, save the attainment of asepsis and the maintenance of immobilization. So much for the practical application of what has been determined by long clinical experience to be the best method of grafting. When we come to the academic question of what the physiology of the various elements which go to make up this graft is, we enter upon ground which even to this day is a battlefield and which is as yet undecided. We have made a great gain in knowing how to make a successful graft. However, the practical has outstripped the theoretical, for we do not as yet positively know upon what the life of a graft depends nor where the new bone comes from.

We will first endeavor to classify the various views of authorities and then proceed to elaborate some of them.

1. There is either no or only slight osteogenetic power in the periosteum. (Gallie and Robertson, Murphy, Brown and Brown, Delbet, Davis and Hunnicutt, Macewen, Bancroft, Baschkirzew and Petrow, Wetherill, and Groves.)

2. Osteogenesis lies in the young connective tissue surrounding the transplant. (Baschkirzew, Barth [originally], and Bancroft.)

3. Osteogenesis lies chiefly in periosteum and to a much less extent in endosteum, marrow, and haversian canal linings. (De Gouvea, Axhausen, Lewis, Nicholls, Lexer, Ochsner, McWilliams, Schepelmann, Streissler, Albee, Stieda, Haas, Lobenhoffer, Ollier, Gill, Ryerson, and Codivilla, Tomita, Phemister, Barth [recently but not originally].)

4. Osteogenesis lies entirely in the osteoblasts within the bone of the graft itself, and its regeneration takes place independently of the periosteum. (Macewen and Groves.)

5. The graft is not osteogenetic in itself but it is simply osteoconductive of cells from the contacting extremities of other living bone. (Murphy, and Barth [originally].)

There are three distinguished names in the history of bone-grafting: Ollier, Barth, and Axhausen.

Ollier's conclusions, according to Axhausen, are:

1. Bony material of different origin and preparation can become operatively incorporated in the body without being extruded.

2. There is a fundamental difference in the relation of the healed in bone between living, periosteum-covered bone from the same species on the one side and any other bony material on the other.

3. Only the first shows increase in thickness after healing in by quick formation of inner fibrovascular connections, which result from the laying down of newly formed bony tissue by the periosteum, which remains living. The increase in thickness is the single sure sign

of the continuance of life. Only by such bone can there arise the possibility of a true union with preservation of vitality.

2. Every other bony piece dies, even though it were not dead when transplanted. Such pieces remain either unchanged as foreign bodies while the surrounding tissues furnish a connective-tissue capsule, or they become absorbed, which process is often hastened by their becoming honeycombed with blood canals. Such bony pieces implanted into an osteogenic layer, under certain favorable conditions, can become replaced by new formed bone tissue from the neighborhood.

3. In every instance where there is an endeavor to obtain lasting bony replacement for lost bone, one must in principle use exclusively living periosteum-covered bone from one of the same species.

These teachings of Ollier remained undisputed till Barth maintained, about the middle of the nineties of the last century, that any bone, whether living and periosteum covered or living without periosteum, whether boiled or macerated, took up the rôle of a dead foreign body, which could fulfill a certain mechanical end when surrounded by living tissue, but which was gradually replaced by new formed bone tissue whose origin in no way could spring from the periosteum or marrow of the implanted bone, but could come alone from the osteogenetic tissue of the surrounding parts; thus it was demonstrated that living grafts have no advantage over dead ones.

Thus stood transplantation until 1908, when Axhausen, as a result of thorough microscopical examination of a human graft and after numerous animal experiments, published the following conclusions:

1. The Barth statement of the histological indifference of any bony implantation material cannot be held as correct.

2. The fundamental difference maintained by Ollier between living periosteum-covered bone from one of the same species on the one hand, and all other bony material on the other, corresponds in its practical side to the facts. It applies both to the human as well as to the animal race.

3. The difference does not lie biologically in the relation of the bony tissue itself, as Ollier maintained. Contrary to Ollier, Barth's statement is correct when he says that in the transplantation of living, periosteum-covered bone from one of the same species, the bony tissue itself dies and is replaced by new formed living bone.

4. The difference lies alone in the presence of the living, periosteal covering.

5. The living, covering periosteum does not in all cases undergo necrosis, as Barth maintains, as is the case with the bony tissue itself, but the periosteum remains under favorable conditions in use, as in animals, at least partly living, and develops from these parts a bone-forming activity which increases in extent and remains permanently, replacing the old bone.

Barth has lately changed his opinions and now accepts the views of Axhausen that the compact bone of the graft is absorbed and is

replaced by bone formed by the periosteum and endosteum of the graft.

Thus we see that Ollier thought that when autoplasmic bone plus periosteum and endosteum was transplanted into a position where it had a function to perform, the entire transplant lived, while Barth claimed that the entire transplant died and was replaced by an ingrowth from the surrounding proliferating bone. Axhausen believes that the periosteum and endosteum alone remain alive while all the bone-cells except a few about the cortex undergo necrosis and absorption. The periosteum and endosteum proliferate and the cells thus formed help to form the union between the graft and the bone into which it is transplanted. These cells also grow into the haversian canals with revascularization, absorb the old bone and deposit new in its place.

Macewen, of Glasgow, in 1912, advanced the view that the bone in a graft is reproduced from the proliferation of osteoblasts derived from the osteoblasts within the bone of the graft itself, and its regeneration takes place independently of the periosteum, whose only function is that of a limiting membrane, which prevents the spread of the osteoblasts into the surrounding tissues.

Shortly after Macewen, in 1912, Murphy maintained that the graft was not osteogenetic but simply osteoconductive. Provided it be in contact at one or both extremities with other living bone, the graft acts simply as a scaffolding for the growth of the capillaries with their osteogenetic cells as they advance from the living, contacting extremities into the graft. The periosteum takes no part in the actual reproduction of new bone. This largely follows out Barth's original views.

The following are the conclusions of some of the authorities who do not believe in the osteogenetic power of the periosteum.

Gallie's conclusions, as a result of experiments made with grafts without periosteum, are as follows:

1. Death of the graft.
2. Revascularization of the graft.
3. Concomitant absorption of the dead bone and production of new bone by the bone-cells which invade the graft along the route of the new blood-vessels.
4. These experiments show no difference in the value of fresh or boiled bone as a transplant and no difference in the gross and histological changes induced upon the introduction of autogenous and heterogenous bone-grafts.

Bancroft's conclusions in a series of experiments in which two types of repair of bone have been observed, are as follows:

1. Where the periosteum has been well stripped off the bone for a distance of several centimeters it is separated

from it by serosanguinous fluid. Here the bone has apparently been repaired from the medullary cavity by a framework of connective tissue upon which calcium salts have been deposited, forming osseoid tissue; there has also been a reparative process from the connective tissue of the haversian canals at the sides of the bone incision.

2. Where the bone has been repaired under a definite fibrous connective-tissue capsule, which is continuous with periosteum and also adherent to the surrounding muscles, it has been found that this connective tissue is apparently not different from other connective tissue, except that in immediate approximation to the newly forming bone there is a single layer of cells which are larger in shape and have nuclei that take a heavy stain. In places, there is a metaplasia from the connective tissue cells to these osteogenic cells.

In the process of repair in fractures by the output of callus, there is a metaplasia from connective tissue which seems to arise from the surrounding tissues rather than to be a direct continuation of the periosteum. There is also a direct metaplasia from a tissue closely resembling fibrocartilage into young bone.

In attempting to draw clinical deductions from these experiments in regard to transplantation of bone, it is reasonable to assume that the periosteum acts as a limiting membrane to the bone, tends to conserve its shape, and to furnish its blood supply. If the periosteum is stripped from the bone of the transplanted part, numerous thrombi will occur where the vessels enter the diaphysis; but if the periosteum is left attached, the blood-supply will probably be more quickly established through the vessels of the periosteum.

If small pieces of bone are transplanted, it is obvious that haversian canals must be cut in many directions, thus allowing easy ingress to the newly forming blood-vessels. The fragments must also receive a good blood-supply from the entire periphery. They grow in this case without the aid of periosteum.

Davis and Hunnicutt's conclusions are as follows:

Free periosteal transplants did not produce bone in the large majority of experiments, even though osteoblasts were adherent to the transplants.

Pedunculated flaps of periosteum did not produce new bone.

Free periosteal transplants and pedunculated periosteal flaps, with bone shavings attached, produced bone in each experiment. From this we may surmise that bone particles had been accidentally transplanted in those experiments in which bone was found after the transplantation of free periosteum.

The removal of periosteum had little, if any, effect on the nutrition of a bone. The surface from which the periosteum was removed showed very little overgrowth of bone, unless there had been considerable irritation of that surface, either by trauma or by infection. The area from which the periosteum had been taken was covered with a thin, very adherent, fibrous membrane; or the muscle was adherent to the denuded area.

Both auto- and iso-bone, without periosteum, were effective in repairing skull defects.

Auto- and iso-bone, without periosteum, when transplanted into the periosteal tube after subperiosteal resection of a rib caused stimulation of bone growth from the periosteum and also the rib ends.

Transplants covered with periosteum, and also foreign bodies, stimulated bone growth only from the rib ends.

After subperiosteal resection of a portion of a bone, the growth of a bone in repairing the defect was from the bone-stumps, the periosteum acting as a limiting membrane.

Autobone, both with and without periosteum, lived and was successfully transplanted to fill defects in bone. Clinically, it is advisable to transplant bone covered, in part at least, with periosteum.

Iso-bone in a bone defect acted as a scaffold for the growth of new bone from the living bone-stumps, but there was ultimate absorption of the transplant.

Brown and Brown's conclusions are as follows:

1. We have been unable in any experiment to reproduce bone from free periosteal transplants into the subcutaneous tissue and muscle.

2. We have been unable to reproduce bone in the periosteal flap raised, left in contact with the bone, passed through muscle, and again contacted with periosteum, with the one single exception where there was a small nodule of bone formed apparently in the free end of the flap, corresponding to another nodule formed on the shaft of the bone opposite, leading us to believe that the bone in the tip of the free periosteal flap was an osteoblast raised from the corresponding area on the shaft of the bone and also because no bone had formed anywhere else in the flap.

3. We have been unable to reproduce bone in a single experiment from free bone transplants, without periosteum, into the subcutaneous tissue and muscle, regardless of the age of the transplant. Absorption was the rule in every case.

4. We have been unable to reproduce bone in a single experiment where bone was transplanted free, periosteum left intact, into the muscle or subcutaneous tissue. These transplants were uniformly absorbed.

5. We have been uniformly able to reproduce bone when transplanted and contacted with living bone, if it were in position where it had a function to perform, except in one experiment where the transplant was only 9 days old.

6. Other necessary conditions being present for its reproduction, bone reproduces bone without the aid of periosteum.

7. Our transplants that were contacted with living bone and had no function to perform were inclined to absorption.

8. While periosteum may be an aid to the life and growth of bone, we have not been able to prove in any experiment that it was at all essential.

Baschkirzew and Petrow believe osteogenesis lies in the connective tissue surrounding the transplant. In their communication from the St. Petersburg Medico-Military Academy, extensive animal experimentation is described and illustrations given of those cases in which a long bone-graft was implanted. The results confirm the possibility of successful transplantation, provided the implanted bone is living and is taken

from the subject or from another of the same species. Illustrations of one patient four years after the graft showed that an autoplasmic shaft of bone from the fibula of the left leg, 9 cm. long, taken out of its periosteum, healed in place and functionated perfectly, taking the place of the right ulna which had been removed for a supposed sarcoma, although the lesion proved to be tuberculous. The illustrations show further the regeneration of the fibula from the periosteum which had been left in place, a stout although rather uneven new fibula resulting. A scrap of the grafted bone under the microscope showed many dead, but also numbers of living, bone-cells. Grafts and consecutive regeneration progress far more satisfactorily when autoplasmic material is used. "There is no other conclusion possible to draw from this case than to accept the statement that the chief spring of the regeneration in a bone transplant into the soft parts lies in the young connective tissue which arises out of the original granulation layer about the transplant." He says the bone in a transplant gradually dies but exercises upon this connective tissue a specific irritation which leads to the formation of new bone. The old bone serves as a scaffolding and in this the process of the substitution takes place. Regeneration and bony new-growth taking place out of the cellular elements of the endosteum and periosteum cannot be denied. However, they are of less importance than the replacement out of the elements of the connective tissue.

For Bancroft's views see page 2.

3. The following authorities with their respective conclusions believe in the osteogenetic function of the periosteum (for further facts see page 19.)

Lexer says: "Even the greatest bony defects, such as an entire diaphysis or a portion of the skull, can be replaced with complete clinical success by bones of any kind or origin — whether living periosteal bone or dead bone, either auto- or homoplasty — even by foreign material such as ivory, metal, or horn, provided that the periosteum in the wound is entirely retained and remains united to the soft parts. If the question is of the replacement of a great bony defect, free of any periosteum, there will be success only in case the periosteum on the fresh bony transplant becomes quickly united to the vicinity, that is, if it can receive nourishing vessels from the vicinity rapidly. If the periosteum is prevented from quickly uniting to the neighboring structures by bloody or inflammatory effusions, it then dies and cannot exercise

its function of renewing the bony substance. The rôle of the periosteum in bone transplantations consists, in the first place, in its close union with the surroundings which nourish it, and, secondly, in its activity in forming bone. The periosteum gets its nourishing vessels entirely from the immediately adjacent soft parts. The anastomosis through the cortex springing from the marrow, plays scarcely any rôle. The productive strength of periosteum, as well as of the endosteum and marrow, depends upon new formation of external blood-vessels." Lexer lays emphasis upon the vessel relations in the healing of fractures. He has demonstrated a very large amount of new vessel formation about a fracture spot until the fracture is healed, then the vessels disappear. These vessels arise from the periosteal network, not from the nutrient artery which is torn by the fracture. The lion's share in the quick healing of a fracture depends upon the nourishment brought by the periosteum through rich vessel new formation. Consequently, in operating on fractures, in laying the fracture ends bare, the periosteum under no conditions should be robbed of its union with the soft parts, and secondly, one should avoid injuring the periosteum.

McWilliams' views, based on his experiments and human transplantations, are as follows:

Were the blood supply perfectly restored in the bone of a living graft, then it is evident that the graft would not die and would not become absorbed. But this is not the case as the physical properties of bone prevent absorption of blood sufficient to maintain the life of the bone until the vascular circulation is reestablished, consequently, more or less of the bone dies. Undoubtedly many of the bone-cells on the surface survive while the deeper ones die. In any case it is a varying question as to how many of the cells actually survive. The inner layer of the periosteum, the endosteum and, to a much less, if not negligible, extent, the lining of the haversian canals provide the cells for osteogenesis in bone repair, to which may be added the comparatively few bone-cells in the graft itself which survive. Of these the periosteum is much the most important, probably doubling the combined powers of all the other elements. This relation McWilliams found to be as follows: every graft (36 in number) made by the author with periosteum lived, while of 38 grafts made without periosteum, but 21, or 55 per cent, survived. Of these grafts made without periosteum, the new bone must have come either from the endosteum or the lining of the haversian canals or the surviving cells of the graft itself, or all combined, leaving out of account the surrounding connective tissues. If this be true, then the relative importance of the periosteum, as compared with the combined powers of the endosteum, the lining of the haversian canals, and the surviving bone-cells, is as 100 to 55. The author has made four human transplantations without periosteum, all of which healed by primary union. In not one of these did the graft survive, all gradually becoming absorbed by molecular disintegration. In each of these transplants, without periosteum, there was endosteum

three being made with entire sections from ribs and the fourth being taken from a section of the tibia with endosteum on it, together with bone-cells and the haversian canal linings. Consequently, from this we see that the periosteum is a very important structure in osteogenesis and bone-graft repair. Of the few reported successful bone transplantations made without periosteum, the influence of the endosteum has not received sufficient attention, although its power of osteogenesis is far inferior to that of the periosteum.

Oechner's conclusions are as follows:

1. The autogenous transplantation of bone is an established surgical procedure.
2. Whether dependent for growth on periosteum or upon the graft as a scaffold for the development of blood-vessels, transplants should for the present be provided with both, particularly plenty of periosteum.
3. Non-absorbable material had better be avoided whenever possible; dovetailing and absorbable suture material should be used in their stead.
4. It is highly probable that organized bone tissue will in the future take the place of foreign material now used in the Lane plates for fractures.
5. For the present the thorough applicability of heterogenous grafts has not been established.
6. Bone grafting should never be done in the presence of an active infection.
7. Most rigid asepsis should be exercised.
8. Bone-grafts probably owe their vitality and ultimate success to the rapidity of blood-vessel development plus the presence of osteoblasts wherever they may be.
9. Growth in the length of bone may be confidently predicted in the case of children when the epiphyses remain intact.

Albee's conclusions are as follows:

1. My experience as to the trustworthiness of the bone-graft as a surgical agent, when taken with its enveloping membranes (periosteum and endosteum) and contacted with bone, has been borne out by Murphy, McWilliams and others, who have obtained practically 100 per cent of successes. In my last 100 cases the successes have been 100 per cent.
2. The endosteum, marrow substance, and periosteum should be included on the graft, as they play a most important rôle in aiding to establish an early and sufficient blood-supply from the recipient tissues to the cortical part of the graft. The endosteum, as well as the inner layer of the periosteum, is also actively osteogenic.
3. A rapid and complete union between graft and recipient bone should be in many cases enhanced by the interposition of numerous small grafts in which the periosteum may be disregarded because of the easy access of blood-supply to their interior osteoblasts. These coalesce with each other and also with the recipient bones and the large graft.
4. The living bone-graft has certain bacteria-resisting properties, as evidenced by two of my animal experimental cases where sepsis occurred and parts of each graft became united to the recipient bones, while the rest of the transplant succumbed to the infection and sequestered.
5. The bone-graft apparently acts always as a stimulus to osteogenesis to the bone into which it is ingrafted or contacted.
6. The bone-graft when well contacted becomes immediately adherent to the recipient bone by newly-formed tissue which changes to solid bone within four weeks' time. This together with its bacteria-resisting property

strongly favors, in the author's opinion, the substitution, when feasible, of the bone-graft in place of all metal internal splints, especially when it is appreciated that metal has the opposite effect to the graft, in that it inhibits callus formation, produces bone absorption, and favors infection.

7. The dowel, the inlay, and wedge bone-graft afford a means of repairing and remodeling the skeleton which the surgeon has not hitherto possessed.

Phemister has written an exceedingly valuable report on his experiments in bone transplantations. His conclusions are as follows:

1. Osteogenesis in bone repair occurs from the inner layer of the periosteum, from the endosteum, and to a much less extent from bone-cells and fibrous contents of the haversian canals.
2. Viability of the cells of the transplant is dependent largely upon their ability to get nutrition and to some extent upon their degree of cell specialization. Periosteum and endosteum, being superficially located, receive sufficient nutrition to survive and proliferate. The great mass of bone-cells being away from the surface and surrounded by an extensive and difficultly permeable calcified matrix gradually undergoes necrosis and absorption. A few about the periphery and lining the larger vascular spaces, as well as the fibrous elements of the latter, may survive and proliferate. Blood-forming cells of the marrow, despite their favorable nutrition and probably because of their greater degree of specialization, gradually undergo necrosis.
3. The subsequent changes which the transplant undergoes depend upon its composition and location. According to Roux's law of functional adaptation, a transplant placed in a useful location, i.e., a bony defect, undergoes progressive changes, while one in a useless location, i.e., soft parts, undergoes chiefly retrogressive changes and is gradually removed.

A. Transplantation into a bony defect.

Functional demand stimulates the surviving cells of the transplant to osteogenesis. Callus forms at either end which helps to unite the transplant and the fragments. Creeping substitution of the dead cortex gradually occurs by the ingrowth of capillaries with dilatation of the haversian and Volkmann canals, absorption of the old bone and deposition of new bone in its place.

(1) When periosteum and endosteum are left on, the transplant contains the greatest number of living osteogenic cells. Consequently union between the ends and substitution of the dead cortex occurs most constantly and rapidly.

(2) When periosteum is removed, osteogenesis producing union and substitution occurs from the endosteum and the few surviving cells of the cortex, but the process is much slower than when periosteum is left on.

(3) When both periosteum and endosteum are removed, new bone formation from the few surviving cells is slight, and union with the ends of the fragments and substitution of the dead bone are very much delayed.

If such a transplant is cut into small pieces before implantation, more cells survive because of the increase in surface and facilities for nutrition and greater functional irritation. Consequently, considerable callus forms from each piece, and, fusing with that from the others and from the ends of the shaft, rapidly restores the continuity of the shaft. Ossification of the callus proceeds from the surface of each piece, and substitution of their dead portions gradually occurs.

Axhausen's claim that osteogenesis does not occur from

transplanted bone devoid of periosteum and endosteum is inserted. Finally opposed to the old view of Barth, now advocated by Murphy, that there is an autogenesis from any portion of a transplant, substitution occurring entirely by an ingrowth of the fragment ends.

(4) Periosteum transplanted into clean defects and subperiosteal anastomosis failed to regenerate bone and restore the shaft, but in subperiosteal reactions with reimplantation of cortex, either alone or after being boiled, it formed a layer of callus about the reimplanted portion. Subperiosteal reaction of the humeral shaft in the young was followed by regeneration of the shaft.

Periosteum gets its chief impulse for autogenesis, not from an injury to itself, but from the injured bone in which it is attached or intimately related to and which demands repair.

B. Transplantation into soft parts.

The same persons survive as in a bony defect, but since there is no functional demand for bone in this location little proliferation or substitution occurs and the transplant is gradually absorbed.

Transplanted periosteum produces little or no new bone for the same reason.

a. The presence of an infection, if severe, results in death and lysis of the transplant; if mild, there is set up in it an osteomyelitis with excessive proliferation and absorptive changes, but the transplant takes and is functionally a success.

c. A fracture through a transplant unites by callus formed from the surviving cells of the transplant in the vicinity of the fracture.

Lewis concludes as follows:

1. Experimental and clinical work demonstrates that the compact bone-graft is gradually absorbed, that it is replaced by new bone formed from the periosteum and endosteum of the graft. The periosteum of the bone into which the graft is inserted plays an important role, and should be saved and brought in contact with the periosteum of the transplant or over the ends of the bone. This is now admitted by Barth, who first stated that a bone graft had merely an osteoconductive function.

2. The viability of bone-grafts is especially indicated by their reaction to infection, for involucrum and sequestrum formation occurs in infected grafts or in those placed in infected areas as it does in normal bone.

3. Bone-grafts placed in cavities, resulting from curettage of osseous cysts, osteoid sarcoma or chronic osteitis, will not survive in most cases, for the hematoma which occurs within the cavity prevents vascularization of the graft. The cavity can be closed most satisfactorily by a bone-plug of some kind.

4. The bony graft in the treatment of old ununited or recent fractures is more satisfactory than the intramedullary splint, for the endosteum of the graft comes in contact with endosteum of the bone, and periosteum of the bone can be sutured to the periosteum of the graft. In the intramedullary splint, considerable endosteum is destroyed in preparing the medullary cavity for reception of the graft, and the endosteum is one of the important factors in bone repair.

5. Compact bone dies in the graft because of its physical properties which do not permit of rapid germination of serum. The best bone-graft contains enough compact bone to give form and maintain fixation and also contains periosteum and endosteum from which the compact bone is substituted. Grafts taken from the antero-medial surface of the tibia are to be preferred to those taken from the crest.

Gill's conclusions are as follows:

1. Bone is only a particular form of connective tissue and is readily transplantable.

2. It contains within itself all the elements necessary to its life, function, and regeneration provided it remains sufficient unimpaired.

3. Periosteum, medulla, and bony tissue should all be included in the graft.

4. After transplantation the bone grows and molds itself to perform its function efficiently.

5. As early performance of function as is consistent with its location in its new position is of great advantage.

6. A mild infection is not necessarily fatal to the graft.

7. Transplantation of long bones with their joint surfaces is clinically possible. The inclusion of epiphyses and joint surfaces in no way adds to the difficulty of the transplantation.

8. Half joints are clinically transplantable. Leaver, Kuttner, Rüding, Wald, Enderlen, Perthes, von Hahnert, Walther, and De Garen have reported successful cases.

9. Whole joints have been successfully transplanted. Leaver has had under observation for six years a knee-joint in which motion and function are perfectly free and satisfactory, although the joint shows under the X-ray certain changes similar to those found in arthritic deformations.

Haas gives the following conclusions as the result of his experiment:

1. The periosteum is directly and actively concerned in the regeneration of bone. In the very early stages the periosteum proliferates to form a cartilaginous tissue, which is later transformed into bone.

2. The exact method of the changes from cartilage to bone cannot be determined. There is considerable evidence in favor of the direct change of the cartilage-cell into the bone-cell. There is at times the appearance of the osteoblast forming bone and substituting the cartilage, therefore it seems as though both processes can take place at the same time.

3. The regeneration of bone also takes place from the marrow and cortical bone, but in a more limited degree and at a later period than that from the periosteum.

4. The regeneration of cartilage takes place almost entirely from the perichondrium. It proceeds by a direct proliferation of all the layers of the perichondrium beneath the outer fibrous tissue. There is some evidence in favor of the view that the connective tissue is first transformed into cartilage under stimulation of the neighboring cartilage or perichondrium.

5. There is a slight amount of regeneration of cartilage from the original cartilage near the perichondrium, but the remainder of the cut ends tends to undergo degenerative changes.

6. The extent of the removed cartilage exerts no influence on the regeneration. (There is no evidence of calcareous changes in the regenerated cartilage, even as late as 45 days.)

Osteogenesis lies chiefly in the osteoblasts within the bone of the graft itself and its regeneration takes place independently of the periosteum. MacCawen's views have already been given and those of Groves follow. Groves,¹ gives "An Experimental Study of the Operative Treatment

¹ Brit. J. Surg., 1912, 4, 426.

of Fractures." A few of his many conclusions are as follows:

17. In the repair of bone defects.
18. Natural repair occurs rapidly when only part of the bone is destroyed.
19. Fragments of bone used as a graft (from the same animal) form new bone very slowly if they are only loosely inserted in the gap.
20. Large pieces of bone used in a graft unite quickly and form the center of new bone growth, if they are tightly fixed to the raw surfaces of vascular bone.
21. The periosteum is the *product* and not the *mother* of bone. All the osteogenetic properties of the periosteum, whether in the repair of fractures or in grafting, are due to the more or less accidental presence of the outer layer of bone-cells adherent to its deep surface.
22. Living bone is the chief source and origin of callus which grows mainly from the outer or periosteal surface and to a less extent from its deep or medullary surface and its cut ends.

CONCLUSIONS

The works, as we have seen, in the last few years upon the subject of bone transplantations are appallingly numerous, both from the experimental and clinical aspects, and they are as yet far from solving the question of whether one can secure a bone-graft with survival of the transplant or whether one obtains only a gradual substitution of the graft by the tissues of the neighboring old bone. But practically and therapeutically very numerous observations have established the great use of the bone transplant. Physiologically, the anatomical evolution of the graft must yet be established, but lack of knowledge of this does not practically prevent the surgeon from obtaining great success with grafts transplanted according to the rules shown to be most successful in the greatest number of transplantations.

INDICATIONS FOR BONE-GRAFTING¹

1. To correct deformities resulting from defects of development, as aplastic extremity bones — radius, ulna, humerus, tibia, fibula, and femur — and congenital and acquired saddle-nose, aplastic mandible, spina bifida, etc.
2. To produce union in ununited fractures. This is the best treatment and much superior to Lane's plates.
3. To replace bone removed by destructive infections, osteomyelitis, tuberculosis, lues, etc., e.g., spina ventosa.
4. To restore or supplant fragments dislodged or destroyed by fractures, as the head of the humerus, head of femur, shaft of tibia, etc.
5. To replace bone removed for non-malignant neoplasms, cysts, myeloma, osteitis fibrosa, and adamantinoma of the jaw.

6. To replace bone removed for encapsulated malignant disease, as giant-celled and chondrosarcoma, etc.

7. To immobilize joints, as, for example, those with too great laxness or imperfect muscular control, resulting from infantile paralysis or Charcot's joint, and for the cure of tuberculosis of joints, as in bone-grafting for tuberculous spine (Albee's operation).

METHODS OF BONE TRANSPLANTATION

For the sake of completeness the entire range of transplantations which have been done are now given in the following table:

METHODS OF BONE TRANSPLANTATION

1. Heteroplasty:
 - a. Foreign substances such as ivory, silver, magnesium, horn, etc.
 - b. Animal bone:
 1. Living.
 2. Dead.
 3. Decalcified bone.
2. Homoplasty:
 - a. Living bone preferably taken with periosteum either from a cadaver immediately after death or from a fresh amputation.
 - b. Dead bone either boiled or sterilized in antiseptics.
 - c. Transplantation of joints from fresh cadavers, resections, or amputations.
3. Autoplasty:
 - a. With pedunculated bone-flaps, necessarily with periosteum.
 1. With temporary pedicle, e.g., Reichel's operation on tibia.
 2. With permanent pedicle with either cutaneous or musculocutaneous or periosteal flaps.
 - (a) Ollier's operation *par retournement*.
 - (b) Ollier's operation *par glissement*.
 - (c) Ollier's operation *par implantation*.
 - (d) Müller's two operations.
 - (e) Hahn's or Huntington's operation.
 - b. With non-pedunculated bone, i.e., free grafts.
 1. Transplantation with small chips with or without periosteum.
 2. Transplantation with large fragments always covered with as much periosteum as possible.
 3. Transplantation of a part of the shaft of a bone plus one of the articular ends.
 4. Transplantation of joints.
 - c. With pedunculated or non-pedunculated periosteal flaps (Codivilla's operation).

¹ Modified from Murphy. J. Am. M. Ass., 1922, 1901.

It shows the historical development of what has been proved to be the best clinical method of performing a successful transplantation; viz., to transplant a free, living graft, with as much periosteum on it as possible, taken from the patient who is to be grafted. There may be some rare instances where some other one of the homo- or autoplasmic procedures, to be later mentioned, may be advisable, but these are rare. A pedicle has been proved to be not at all necessary. It simply complicates what is ordinarily a much simpler method. There are instances, however, where it is necessary to supply not only bone but also soft parts, in which a pedicle will be the best method, such instances are the supplying of soft parts as well as bone to make up the loss of the entire nose or to supply not only portions of the lower jaw but also the soft parts over this which may be lost, e.g., shot away or resected for cancer, etc. In case a homoplasmic transplantation is deemed advisable the bone should be taken from a very near relative, e.g., from father to child in a case of spina bifida. Heteroplasmic transplantations have been proved to be very unsatisfactory and have been practically given up.

GENERAL PRINCIPLES TO BE OBSERVED IN BONE TRANSPLANTATIONS

1. Most scrupulous asepsis is an absolute essential to perfect success. It is most important that no infection be introduced into a clean field at the time the graft is transplanted. To this end the operator, assistants, and nurses should all wear rubber gloves, and the same scrupulous Lane technique should be employed as in fracture operations. Nothing that has been touched by the hand should go into the wound or touch the graft and all instruments and gauze wipes should be handled by instruments. It is advisable not to tie vessels but to allow the artery forceps to remain hanging *in situ* during the operation, after which they can be removed with little danger of bleeding. All sutures should be tied by means of clamps to avoid touching the sutures with the hands. Instruments once used should be laid aside and reboiled before using again. Sterile towels should be clamped all about the edges of the wounds so as to exclude the skin from the operative field. All this applies both to the site of the graft as well as to the field from which the graft is removed. A new knife should be used after the skin is incised and the old one should be laid aside. Tincture of iodine should be applied to the cut skin edges immediately after incision.

2. In general it may be said that all sinuses should be perfectly healed for at least three or four weeks before grafting is attempted so as to prevent infection of the graft. While infection does not necessarily mean the death of the whole graft, yet the danger that it may entirely die is great. Lewis has demonstrated in two cases that a transplant may be inserted into an infected area with the object of affording merely a mechanical support to prevent deformity, even if it is necessary to remove it later. In some instances such grafts may remain viable and hasten convalescence. (See under the effects of infection on grafts.)

3. The graft should be taken living from the same individual who is to receive the graft, i.e., an autoplasmic graft, if the best and surest means for success are followed. If this be not possible, which is very rare, then it should be taken from as near a blood relative as possible. Animal bone should never be used because such a graft will be absorbed owing to the changed serological and chemical relations. If taken from another individual, syphilis should be ruled out by the Wassermann reaction and tuberculosis excluded.

4. A living graft should be transplanted *adhesiv* with as much periosteum covering it as possible. Without the periosteum the life of a graft has proved to be uncertain. Its retention will assure success if asepsis be attained. The question of just what the function of the periosteum is is an academic one. Practically the periosteum seems necessary for success in the greatest number of cases. Less important for success but still advantageous is to have endosteum also on the graft, for the whole of a thing is greater than any of its parts. The value of marrow seems to be small; according to some authorities it is disadvantageous.

5. The success of a graft seems to depend upon a speedy adherence of the periosteum to the surrounding parts that the blood supply may be as quickly established as possible. Effused blood will prevent this adhesion, hence bleeding and oozing should be checked to the greatest extent possible. In addition a blood-clot about a transplant does not permit of the permeation of serum into the bone and also prevents vascularization. Lewis gives several instances in which hematoma caused absorption of the grafts. On account of the oozing subsequent to the loosening of a tourniquet, this had best not be employed.

6. No drain should be used since this predisposes to infection.

7. A motor saw is of inestimable value in bone-grafting operations.

8. In taking a graft from the tibia, its crest should not be employed, for this is the strongest part of the bone and its removal will predispose to subsequent fracture. Before this was appreciated, McWilliams had two fractures of the tibia from whose crests grafts were taken, while other fractures have been reported. If the crest is used, the limb should be strengthened by a plaster splint for several months after the transplantation, as new bone in such a defect is but slowly re-formed.

9. All foreign non-absorbable material, wires, nails, celluloid, horn, rubber, etc., should be avoided as implants, except under very exceptional conditions. Encircling wires will erode the bone and a fracture may result. These non-absorbable foreign bodies tend to irritate, if not invite, suppuration and often produce sinuses which will usually require their removal. Chromic gut or kangaroo tendon should be used to fix the grafts in position.

10. When the head of the humerus, or radius, or femur is fractured and dislocated and the joint is opened, then the head should be replaced and attached to the freshened lower fractured surface, even though the head be dead, provided it is still aseptic (Murphy).

11. A graft increases in size according to the demands put upon it by the organism. Experience has taught that it is unnecessary to laterally fill up a defect completely with a graft. It is essential only to fill up a defect vertically, leaving Nature to do the remainder.

12. After transplantation absolute immobilization is essential for success. This should be maintained for at least three or four months, longer if röntgenograms show its necessity.

13. The periosteum of the bone into which the graft is inserted is an important element and should be preserved and brought into contact with the periosteum of the graft or over the ends of the same if possible.

14. The inlay graft in the treatment of fractures is to be preferred theoretically to the intramedullary splint, since endosteum comes in contact with endosteum while the periosteum of the graft can be sutured to the periosteum of the bone. A much more successful method of treating non-union in fractures than a Lane plate is the bone-graft. The intramedullary splinting has, however, given good results in the hands of many surgeons, particularly Murphy.

15. Transplantation of long bones with their joint surfaces has been successfully performed, as has been the case with half joints and with whole joints in a few instances.

16. A suggestion by Huntington seems valuable. He has found that the periosteum of a graft may be preserved *in situ* during operation, by wrapping the fragment closely with zero catgut. Before closing the wound, the strands of gut are divided and removed or cut short.

17. In operating on clean, comminuted fractures, the fragments should be replaced in their original positions if possible. If this be not possible, the pieces should be fragmented, retaining all the periosteum possible on the fragments, and replaced about the fracture spot.

18. The site from which a free graft may be obtained seems to depend upon the individual preference of the surgeon. The majority seem to have used the tibia, while the fibula has been preferred by others. In a few instances grafts have been taken from ribs, clavicle, scapula, and the crest of the ilium.

HETEROPLASTIC GRAFTS

Heteroplastic grafts are those made up of either foreign or alien grafts such as ivory, horn, rubber, silver, magnesium, etc., and animal bone both living and dead. They are either absorbable or unabsorbable.

Little space need be taken up with a discussion as to the advisability of using these grafts. They are more than doubtful in their results and the method has been generally abandoned. To understand, however, the development of the present successful methods of grafting it will be necessary to consider heteroplastic grafts for a moment, for it was almost the first method employed. The more than doubtful results obtained led to further researches to find a successful method.

1. *Foreign substances.* Since aseptic operations have become so successful, it is possible to have large foreign bodies heal in the body tissues without irritation. A good example is the Lane steel-plate. Unabsorbable material as such may remain *in situ* but it can never form a firm substantial adhesion of itself. It is encapsuled in connective tissue and this later can only become occasionally ossified in case osteogenetic tissue is present in the vicinity, as Pean's case shows. In the situation where there is no osteogenetic power present, where, instead of callus formation, resorption processes of the fragment have the upper hand, absorbable material will be absorbed without bone production, and the defect will be closed by connective tissue merely. Where the foreign substance is in an osteogenetic bed, it may become encapsuled in a bed of new bone. On the irritating properties of the foreign material

will depend how much secretion is produced. If this be large a sinus will form and the foreign material will be extruded, or it must be removed before the sinus will heal. Such foreign material may serve a useful purpose in affording support until the periosteum of the vicinity shall form new bone. The present tendency in surgery is to avoid, as much as possible, implanting any unabsorbable material whatsoever. Animal grafts, both living and dead, with or without periosteum, show almost no ability to produce new bone themselves and they have little stimulating effect upon the old bone to produce callus. At best they act but as a support until the old bone may perchance produce some new bone. This new bone is usually small in amount and insufficient.

Instances of the implantation of foreign material are as follows: Kronacher reported the case of a five-year-old boy, three-fourths of whose fibula he had resected for sarcoma. Five days later he implanted a 15-cm.-long solid ivory prosthesis between the remaining bone ends. About three months later amputation had to be performed because of recurrence. The specimen showed that the invaginated ivory implant was surrounded at the upper diaphyseal end by a bone layer 4 to 5 mm. thick and on all sides was enclosed by a periosteal like, 1 mm. strong membrane and was enclosed at the malleolus by a walnut-sized cartilaginous like layer.

Prevost had resected the tibia for a tuberculous focus and filled the defect with small decalcified bone pieces. Smooth healing resulted, and, later, a röntgenogram showed no difference between the new and old bone.

Pean resected subperiosteally the upper half of the humerus and in the defect he placed a complicated prosthesis made from platinum and rubber which was fashioned after a joint and was movable. The patient wore this prosthesis for two and one half years when a fistula occurred. At this time it was shown that the periosteum had produced new bone. The prosthesis was removed and the fistula healed.

Brendt implanted in a case of one-sided resection of the lower jaw a prosthesis of celluloid. This prosthesis was worn without reaction for four and one half years. The mouth can comfortably be opened and closed. He says in conclusion, "that such a large foreign body, a celluloid ring corresponding in size to the half of the lower jaw, healed in without fistula formation is remarkable."

Gluck in 1860 implanted in a case of resection for osteosarcoma of the lower epiphysis and the

condyles of the humerus, a 15-cm.-long ivory cylinder which was implanted into the medullary cavity of the humerus. He removed it later but accomplished through its stimulating influence a good functional end-result. He has published reports of a number of ivory implantations and his operations rely upon the healing in of foreign bodies which possess the only purpose of stimulating new bone from the vicinity. Wachsmann in 1913 reported the results of a large number of ivory implantations according to Gluck's method, with success in many cases.

Kausch reports the implantation of a metal foreign body in a resection defect in the humerus. The foreign body was removed after four and one half months because of continuous fever.

König implanted in a gymnast a 15-cm.-long ivory bone into the upper humerus. It healed in aseptically but the result was ruined because exarticulation had to be performed because of a recurrence.

Mysch attained good results in three cases in which he transplanted cow's horn.

König reports a case in which the trochlea and a hand's-breadth of the humerus above it were removed in such a manner that the external condyle and a humerus span just above it remained. He implanted into it a modeled ivory prosthesis which healed perfectly. The result after a year was painless; there was movement to more than a right angle and the joint was not flail in the least.

König gives his conclusions as to the implantation of ivory, with the results of eight cases after two years. He is enthusiastic as to its use.

Greifenhagen has used the method of Lexer, of bone-doweling by means of animal horn, ten times. He says the functional and anatomical results were very good.

Duvergey removed almost the entire tibial diaphysis for osteomyelitis. The defect was filled in by a correspondingly long piece of decalcified bone. There was profuse suppuration with sequestration of small bone pieces. The bone healed after 8 months with very good results.

A combination of heteroplasty and homoplasty was used in the following case. The transplants were grafted into a granulating field. Poncet in 1886 resected, in a boy of 15, almost the entire diaphysis of the tibia for osteomyelitis, leaving *in situ* the superior articular surface. A month after this operation, there being no fever and the granulation tissue being of good appearance, he transplanted into the defect bone fragments from a tibia and a fibula taken from a newborn babe, one hour after birth, who died of asphyxia.

They measured 8 mm. in length and 4 mm. in thickness. They were placed in the midst of the proud flesh which more or less surrounded them. These bone fragments united for the most part. Fifteen days after this operation, he transplanted at the same time bone fragments coming from the tibia and the fibula of a kid which was killed for the purpose. United to their bone fragments, covered with their periosteum, they formed a bony column 8 cm. in height and about 5 mm. in thickness. Cicatrization was complete in two months. In six months one could demonstrate a newly formed tibia. Poncet reports the condition of the case after twenty-five years. The lower limb is 9 cm. shorter than the opposite extremity but the foot is at a right angle. The tibia is solid and has the same dimensions as the opposite one. The patient wears a sole in his boot and there is not the slightest sign of fatigue on walking. The repaired leg is as good as the opposite one. Röntgenograms show no trace of the old bone-grafts. Poncet says that the grafts probably did not grow, possibly they were absorbed after a greater or less length of time but they served a very useful purpose in stimulating osteogenesis in the neighboring tissues.

2. *Animal grafts.* In 1891 Kümmell reported a good result with interoplastic material. He transplanted into an ulna defect a piece from a decalcified ox's tibia. The limb was consolidated in four to five weeks.

McGill in 1889 in a pseudarthrosis of the right radius, the defect being three-fourths of an inch, inserted 13 pieces taken from a freshly killed rabbit's femur. This was followed by prompt consolidation without suppuration.

Patterson in 1878 reported a case of non-union of both bones of the forearm with a defect of three-fourths of an inch in the radius. A piece of a dog's humerus with periosteum was transplanted, the redundant periosteum being brought over the periosteum of the radius where it was sewed. The graft was held in place by silver wires. Two months afterward the wires had to be removed. The small wound remained open for twelve months when the dog's bone, reduced to half its size, came away, after which the wound healed completely. The forearm became very useful. No very definite statement is made as to consolidation.

Tomita reports a bullet wound of the front of the right humerus, accompanied by profuse suppuration. When healed a thigh bone 7 cm. long from a fresh living rabbit was transplanted, both ends being fixed to the freshened fracture ends by

silver wires, resulting in primary union. Twenty-three weeks after the operation the lower fragment end was fast consolidated with large callus formation while the upper fragment had still some movability, although the X-ray showed a large amount of callus which had grown around the implant so that it almost touched the lower callus.

He reports a second case of a bullet wound of the middle of the tibia, accompanied by suppurative and sequestration. The defect which was 12 cm. long finally healed. A piece of thigh bone with periosteum and marrow from a freshly slaughtered calf was inserted, the most careful asepsis being observed. The ends of the transplant were inserted into the medullary cavities of the fragments. Drainage. Primary union. There were no sinuses at any time. Twenty-seven weeks after the operation the patient could walk without crutches and was discharged. The result was excellent.

Farquhar Curtiss reported three cases in which he filled bone cavities with pieces of decalcified bone, with successful results in all.

Moty, in 1895, reported a case of tibial pseudarthrosis in which a living graft from a sheep's tibia was implanted. There was expulsion of sequestra from time to time, but no consolidation. He also reports a second case of pseudarthrosis of the femur, into which he implanted a living graft from a sheep's tibia. There was no consolidation despite removal of the graft and a second freshening and suture.

Küttner in 1913 reported the case of a child into whose congenital fibula defect he grafted the shin-bone of a Java monkey. As a year and a half has elapsed since the operation a judgment as to the result is now possible. The röntgenogram shows that the monkey's bone is perfectly healed in the tissues, since there is no trace of any absorption and the epiphyseal line is still clearly to be made out. He says "that possibly the transplantation from monkeys is justifiable since the specific blood reactions between men and monkeys show a broad relationship." Küttner has also made a knee-joint transplantation from a monkey to a man with good result.

Allison in 1910 reported the case of a girl of 6, who from lack of development of the left inferior maxilla presented great deformity. The maxilla represented a toothless periosteal band which proved to be well-developed membrane. He implanted beneath this membrane a segment of bone taken from a recently killed chicken. The chicken's femur was split and brought into the required shape by a file before its implantation.

The periosteum was sutured over the graft with catgut. Primary union resulted. Three months later at a second operation the original graft was found to occupy the position in which it had been placed, and its size was undiminished. A second graft was placed in position a little higher and somewhat anterior to the first, which added to the cosmetic effect by lifting up the preceding tissues at the angle of the mouth. There was uncomplicated wound healing and the deformity was practically overcome.

HOMOPLASTY

Homoplastic bone transplantation is the grafting of bone from one individual into another individual of the same species. The graft has been transplanted either living or dead. Dead human bone, just as animal bone and foreign material, plays the rôle of an internal prosthesis rather than that of a true graft. It simply furnishes a conductor, a matrix for the periosteal regeneration of bone coming from the neighboring, living old bone. How much exciting or stimulating influence dead bone will have on this formation of new bone is questionable. The graft can certainly furnish no new bone itself. This form of dead bone transplantation has been discontinued for good reasons. Homoplastic bone-grafts are far inferior in results to autoplasmic bone-grafts; but the grafts should be taken *living* from another individual and always with periosteum. In transplanting joints, it will be necessary to make a homoplastic transplantation. To obtain a living graft, it will be consequently necessary to obtain it from a fresh amputation or from a cadaver soon after death.

The success of such a graft will depend on the serological relations between the individual from whom the graft is taken and the individual into whom the graft is to be transplanted. For in the one case the bone is originally laid down in serum of a certain composition, and bone from this individual may be transplanted into an individual whose serum may be of a somewhat different composition, hence the graft will be foredoomed to more or less chemical change. The chance for success of such a graft in homoplasty will be just about in the same proportion as the success attained in attempting to find two bloods in blood transfusion which will agree and not hæmolyse when mixed. This is advanced as a more or less theoretical suggestion. Certainly bones from different individuals probably have different chemical compositions and the chance of grafting from one individual into another, bone of exactly the same composition would theoret-

ically appear to be doubtful, resulting in cystolysis. In addition, the danger of sepsis and transmitting disease, as well as the inconvenience of waiting for a corpse or an amputation from an assured healthy individual, has caused this method to be almost given up. Homoplastic transplants have been occasionally successful, but not as many of the osteogenetic cells remain alive and actively proliferate as in autoplasmic grafts; hence the formation of new bone is slower, and its extent is less, consequently it is more uncertain as to its ultimate success.

LIVING HOMOPLASTIC BONE TRANSPLANTATIONS

Küttner resected the upper third of a tibia for malignant chondroma in a man of 45. The resected bone was replaced by a fragment of a tibia taken from a cadaver 27 hours after death. This graft was very well tolerated. The patient has a movable knee and can walk.

A successful case combining a heteroplastic transplantation of a kid's bone with a homoplastic graft from an asphyxiated newborn foetus is given by Poncet.

Lexer replaced the upper humerus end including the joint surface by a piece of a freshly amputated femur, with good result.

Fraugenheim reports four cases of doweling with homoplastic material.

Von Haberer resected two-thirds of the upper arm and filled the defect with a periosteum-covered fibula freshly obtained from an amputation. Primary union resulted and in five months the arm was fully functionated.

Baum implanted into four cases of pseudarthrosis, twice bones of freshly amputated extremities, and twice foetal bones. All four cases gave negative results.

Anschutz achieved a relatively good result in a 7 cm.-long congenital tibial defect, which had been autoplasmically grafted several times with no success, by transplanting bone from a perforated foetus. A second smaller attempt with the bone of a seven-months' foetus was unsuccessful.

Ollier replaced the totally necrosed ulna by a bony piece obtained in a fracture operation. After five months the transplant was absorbed.

Poncet filled the defect in a pseudarthrosis of the tibia by half the first phalanx of an amputated great toe. No consolidation resulted. He then transplanted bony pieces taken from a child asphyxiated at birth. These were extruded.

Samter in an osteomyelitic total defect of the tibial diaphysis transplanted a pedunculated periosteal bony flap which led to very small new

bony formation. He then implanted a 14-cm.-long cadaver bone, which after some time was also removed. Final consolidation resulted.

Barth reports the implantation into a tibial defect of a piece of bone without periosteum taken from a freshly amputated leg. Resorption without consolidation resulted. He also reports a case of ununited fracture of the left leg. A graft of a piece of bone without periosteum was taken from a fresh amputation. Absorption of the graft without consolidation resulted.

Grosse of Halle reported a case of pseudarthrosis of the tibia, in which implantation of a fragment from a fresh amputation in an adult resulted in consolidation in a year between the fragments and the graft. Radiographically demonstrated, the graft appears to have undergone complete reorganization and the child can walk well. This case was reported 12 years after the transplantation by Shelda, who says that the graft now cannot be differentiated from the old bone. The child limps because of the shortness of the limb due to the destruction of the epiphyseal cartilage.

Robertson resected the lower ends of radius and ulna for sarcoma, followed by implantation of radius and ulna with periosteum from a freshly amputated arm, the radius being wired. Amputation was necessary twelve months later because of recurrent tumor. Examination showed obliteration of the wrist-joint by fibrous tissue, also that the grafts were living. There was some motion between the fragments.

Morrison reports removing the diaphysis of a tibia for osteomyelitis and transplanting a portion of a fibula taken from a fresh amputation. Six years later the leg had to be amputated on account of deformity and failure to grow. The foreign fibula was not more than a third as large as it was when the operation was done.

Küttner transplanted into the defect caused by the resection of the superior extremity of the femur for sarcoma, an equal upper extremity of a femur removed from a cadaver three hours after death. This fragment was well tolerated. There were two local recurrences which were operated upon with success. Later, at the end of seven months, the patient suffered a spontaneous fracture at the point of union of the dead bone with the old bone. This fracture consolidated, and the patient had very satisfactory use of his limb. Küttner attaches great importance to this consolidation of the fracture and he thinks "that it shows better than any other proof could, that the bony graft had been truly alive."

Stuckey reports a case of pseudarthrosis in the

middle third of the tibia. An osteoperiosteal skin-flap with base external was taken from the upper fragment. The fragments were freshened and the marrow removed. A dowel composed of a portion of the entire thickness of a fibula without periosteum was taken from an amputated leg. The marrow canal of the dowel, which was 11 cm. long, was filled with an iodoform plug, and was placed in the medullary cavities of the fragments and over this the osteoperiosteal flap was fixed with the same periosteal silk sutures. Complete consolidation resulted in 90 days. Nine months after the operation the patient fell and fractured the graft which soon healed. A curved deformity resulted which had to be remedied by osteotomy. Was not this new bone formed from the old periosteum?

Ternier resected the inferior half of a radius for sarcoma. He implanted into the defect a sufficient extent of the fibula taken from an amputation made a few minutes before. Primary union resulted. For nine months he followed the gradual incessant destruction of the graft which by "lacunar corrosion and decalcification" produced a gradual and complete disappearance of the graft. Ternier concludes that the pretended osteogenetic property of the graft does not exist, and that cytotoxicity and progressive absorption are almost the rule for transplanted foreign tissues.

Rovsing resected the lower part of the femur for sarcoma by a section from an old humerus, sterilized with care. The result was bad because the graft broke and there was no consolidation. He waited until he amputated a leg and took a section from the femur which he implanted into the defect twenty minutes after the amputation. A year after the grafting there was a small fistula upon the interior face of the thigh. The patient has resumed his occupation as a vender and gets about on two canes, the limb being strengthened by a leather apparatus.

Macewen in his book mentions a living homoplastic transplantation in a boy, the whole of whose diaphysis he was compelled to remove for necrosis. There was no subsequent osseous deposition. Fifteen months later he was readmitted with the request by his parents that his useless arm be removed. Two wedges of bone were excised from another patient, six years of age, afflicted with anterior curves. The wedges were cut into minute fragments, quite irrespective of the periosteum, and were then deposited into the muscular sulcus in the boy's arm. There was no pus formation. Two months later a portion of new bone, an inch in length and three-

quarters of an inch in thickness, was found firmly attached to the upper fragment of the humerus. Here all the grafts proliferated, grew to one another, and also to the extremity of the proximal portion. Two other wedges of bone of larger size than the first were similarly dealt with and inserted two months subsequent to the first graft, and a third couple were placed in position five months after the first. These all fused together and to the condyles of the humerus, filling the gap in the arm to the extent of four and one-fourth inches. It is now 30 years since the humeral shaft was rebuilt, and during all this time the man has depended upon his physical exertions for the earning of his living. He worked as a joiner for many years, and is now an engineer's pattern-maker.

Trost reports a very successful transplantation of a section of a father's tibia into a spina bifida of his child.

DEAD HOMIOPLASTIC TRANSPLANTS EITHER BOILED OR IN ANTISEPTICS

Von Brunn implanted into a humerus defect a 16-cm.-long piece from fibula which had been boiled for two hours. The result was successful.

Friedrich resected the entire right femoral diaphysis and implanted a dead fibula from a tuberculous boy, with good result. He also resected 12 cm. of the femoral diaphysis. Into this defect was implanted a boiled 15 cm.-long femoral diaphysis of a 65-year-old man who died of carcinoma. Perfect healing in of the implant resulted.

Franke implanted into a resected defect of the carpus, dead bone. No result. Then autoplasy from the tibia with good result.

Kauch in 1906 reported up to that time the greatest case of implanted dead bone which healed in the tissues. A 9-cm.-long piece of the whole diameter of a tibia was obtained the day before from an amputation. It was boiled and then implanted between the resected tibial and femoral ends, which were held by ivory pegs. Primary union resulted. Three-quarters of a year later there was a recurrence. Amputation was performed. Autopsy showed good healing in of the transplant, which was surrounded by new formed periosteum. Case 2. Pseudarthrosis of the tibia. Implantation of a freshly obtained phalanx from a previous operation. The bone was boiled, as fistula developed, the implant was removed. Case 3. Sarcoma of the upper arm. Implantation of two sterilized cadaver humeri. Removal of the same after five months on account of fistula formation. Case 4. Sarcoma of the

upper arm. Resection. Implantation of a freshly obtained cadaver humerus which was boiled for an hour. Removal after one month on account of infection. Case 5. Sarcoma of the internal femoral condyle. Oblique resection of this condyle. Implantation of an old anatomical lower femoral bone which was boiled. Removal of the same on account of purulent secretion on the eighteenth day. Case 6. Sarcoma of the lower femur. Implantation of a boiled anatomical department bone. Removal on account of infection.

Groose implanted in a pseudarthrosis of the tibia, a living exostosis from a 10-year-old girl. There was primary union but absorption of the graft. The same result occurred after implanting a section from an amputated ulna without periosteum. Complete consolidation occurred after the implantation of a boiled piece of a tibia without periosteum from an amputation. Eleven years afterward the röntgenogram gave a single shadow of the tibia.

Stieda implanted in a pseudarthrosis of the arm of a girl, a 16-cm.-long piece of a boiled fibula from an amputation. After a year there was a pseudarthrosis at the upper end of the implant. There developed a fistula with final sequestration, compelling the removal of the dead implant.

Küttner resected the entire super extremity of the femur for sarcoma in a man 31 years of age. He replaced the segment of resected bone by the upper extremity of a masculine femur, taken aseptically from a cadaver, 11 hours after death. This segment was preserved for 24 hours in Ringer's solution with chloroform added. The dead femur was united to the remains of the healthy femur by an intramedullary ivory dowel and the tendons were united to this graft as far as possible. Death occurred thirteen months later from metastases. Autopsy of the graft showed perfect insertion of the muscular tendons of the bone into the dead graft. The functional result was very good and the patient, six months after the operation, could make numerous movements of the hip. The microscopical examination of the fragment of the dead graft showed that it was "little living," and it is very probable that this dead bone was simply tolerated as an aseptic foreign body. Its utility had been considerable, since new muscular insertions were made on its surface and functionally it fulfilled its rôle.

Brewer (Fig. 1) in an as yet unreported case, made the following very interesting homioplastic dead bone transplantation of which the röntgenogram is here reproduced. On January 27, 1912,

he resected the lower two and three-eighths inches of the right radius for a giant-celled sarcoma, removing the entire periosteum with the bone. Three days later a suicide was brought into the hospital and from this corpse was removed a corresponding section of radius, which was then boiled for an hour and kept in sterile salt solution. On the seventh day after the first operation, this dead sterile section of radius was transplanted into the defect in the patient's radius. It was simply placed into the defect and the soft parts were sutured snugly around it. The healing was by primary union and there was never the slightest discharge from the implant. The röntgenogram was taken in July, 1915, three and one-half years after the transplantation. It shows that the proximal end of the transplant is firmly united to the distal end of the old fragment and, roughly, one and three-eighths inches have remained alive, or, rather, osteogenesis has proceeded along the transplant this distance from the old living bone. At this point osteogenesis apparently gave out, for the most distal inch is cloudy and feathery and for the most part has disappeared; that is, absorption has outstripped regeneration. To make up for this defect of an inch the carpus has become dislocated upward and outward from its articulation with the ulna, pronation and suppuration being almost lost. The hand and fingers are very much restricted in their motions and have little strength. It has been proposed to the patient that he undergo the transplantation of his own fibula into the defect, the articular surface of the fibula to rest upon the carpus. Since the muscles of the forearm are probably so much shortened that it will be impossible to replace the carpus upon the ulna, it has been suggested to either remove entirely sufficient of the corresponding lower extent of the shaft of the ulna to allow reduction to be made, leaving the articular surface of the ulna *in situ*, or, since the ulna adds very little in strength to the wrist-joint, a resection of the lower end might be done. One or two authorities maintain that osteogenesis proceeds from the surrounding tissues. If this be the case it is pertinent to ask why in Fig. 1 regeneration was perfect in section D, imperfect in C, while there was none at all in section B?

Streissler reports a case of comminuted compound fracture of both bones of the leg, resulting in a defect of 5 cm. in the tibia, and with overriding of the fibula fragments. After several months the granulating wound was opened, the tibial ends were freshened and the attached fibula ends separated. A 10-cm.-long section from a



Fig. 1. Brewer's case of boiled homograft, three years after grafting. A represents the entire 11+10-cm. graft; B, the completely absorbed and entirely unregenerated portion of the graft; C, the partly absorbed and but partially regenerated bone, osteogenesis being apparently unable to fully traverse the distance to C; D is the perfectly regenerated portion of the graft. Osteogenesis must have come from E, the portion of contracting old bone, since the periosteum from the resected bone was removed with the tumor. According to one or two authorities, osteogenesis comes from the surrounding tissues. If this be the case, why was osteogenesis not as perfect at B or C as at D?

tibia of a fresh amputation was boiled for 20 minutes in soda solution. The graft was then doweled in the upper and lower medullary cavities and fixed by silver sutures. The granulating surface soon became closed in. Progressive radiograms showed lacunar erosions of the graft with gradual absorption. The upper tibial fragment became consolidated with the lower fibula fragment. The remains of the dead graft were finally removed. The fibula gradually increased to three times its normal dimensions, and bore the entire body weight.

AUTOPLASTY

Autoplastic bone transplantation is the grafting into an individual of a piece of bone taken from

some other region of the same individual. For completeness, the various methods of carrying this out are here given: As a result of evolutionary experience, it has been completely and positively established that all pedicles to assure a sufficient blood-supply, except in some exceptional and noteworthy instances, are unnecessary although they give beautiful results. Free grafts have been proved to be very successful if peritoneum be on the grafts and if asepsis be attained. They make a simple operation out of a very complicated one. The importance of the peritoneum will be considered later on under a separate heading as will be the influence of infection on grafts. Pedicled flaps are of use in case soft parts in addition to bone are to be supplied; e.g., in the treatment of gunshot injuries of the face and jaw as well as in loss of both soft and hard parts of the nose. These flaps are usually temporary in character. In other instances the flaps may be permanent, in which case they may consist of skin, periosteum and bone, or they may consist of skin, muscle, periosteum and bone or muscle, periosteum and bone.

1. *With temporary pedicle.* Reichel in a defect of the tibia formed a flap of skin containing periosteum and bone from the opposite tibia. This was transferred into a defect in the opposite tibia and the bridge of skin, which assured a good blood-supply to the graft, was later divided. Coenen in two cases of defects in tibia performed the same operation. Likewise Nové-Josserand, Van Mangoldt, Lambotte, Hashimoto, and others have performed the same operation.

On pages 24 and 25 will be found various temporary pedicled flaps for the formation of a new nose.

On page 32 will be found a method by Nikoladoni of replacing a lost thumb by the second toe by making use of a temporary pedicle.

On page 26 will be found methods of filling a defect in the lower jaw by temporary pedicled flaps, and on page 29 the same procedures for defects in the humerus.

Nové-Josserand: Pseudarthrosis following osteomyelitis of the right tibia. Freshening of fragments, union with silver wire. Osteocutaneous flap formed from left tibia with external base, fastened to the fragments with two silver wires. Section of the cutaneous bridge 113 days later. Consolidation was slow but finally good.

Codivilla: Osteomyelitic loss of substance of tibia. Osteocutaneous graft à la Reichel from the opposite tibia. Consolidation complete.

Coenen: Ununited fracture of the tibia. Graft à la Reichel — temporary pedicle — taken from

the opposite tibia. In the flap was the crest of the tibia with longitudinal pedicle over the fibula, the graft being fixed in place by periosteal and cutaneous sutures. Section of the pedicle was done in three stages: six, nineteen, and twenty-one days after the operation. The result was good.

Bardenheuer and Feinen: Fracture of the middle third of the humerus. A pedicled flap made from the chest, containing the third rib, was sewed into the humeral defect. After two months section of the bridge was done, with good result.

2. *With permanent pedicle.* A graft with a permanent pedicle most nearly approaches the ideal.

Codivilla reports an united fracture of the middle third of the tibia of nine months' duration. A fragment of the fibula which was pedicled by the soft parts was resected and fixed by periosteal sutures to the external surface of the tibial pseudarthrosis. Consolidation was complete. Codivilla reports two successful cases of defects in the humerus filled by transplanting the external border of the scapula, pedicled by the neighboring muscles. Consolidation was complete in each.

Bardenheuer reports a defect of the upper half of the humerus, including the head, with loss of periosteum. The defect was filled with a graft consisting of the spine and neighboring body of the scapula, together with the neck, consisting of a third of the joint surface. The hinge, which was at the acromioclavicular joint, was turned down and fastened to the humerus. There was a permanent pedicle. Three such cases were done by Bardenheuer successfully.

Curtilliet describes a case of ununited fracture of the middle third of the leg. A graft of the superior part of the tibial crest with musculo-aponeurotic pedicle whose base was at the level of the pseudarthrosis, was carried through the anteromuscular mass and fixed in the defect with metal sutures. There was a good result after a year in spite of suppuration requiring incision.

Lambotte reports a pseudarthrosis of the leg in which two periosteal flaps were reflected from the vicinity of the fracture over the fracture. No consolidation resulted. A year later, an osteoperiosteal flap was made from above the fracture which was fixed over the fracture by two screws. Aseptic healing resulted, and the screws were later removed. Consolidation resulted.

Lotheissen tells of a case of loss of substance from osteomyelitis with non-union of the lower. A pedicled osteocutaneous flap was formed from the upper flap which was twisted so as to fit into the defect and fastened by periosteal sutures.

Consolidation was complete in twelve months (see under femur). The same pseudarthrosis (traumatic) of the leg. Loss of tibial substance. An osteocutaneous flap with large pedicle from the lower fragment which is twisted upon the fracture and there fixed with periosteal sutures. Four months later consolidation was still incomplete (see under tibia).

Codivilla in a case of pseudarthrosis subtrochanteric of the femur transplanted a part of the iliac crest pedicled by a flap of the gluteus maximus. It was fastened upon the external face of the femur across the pseudarthrosis. Consolidation followed.

Kauert reports a case of pseudarthrosis of the same right tibia in which he resected a section of the fibula one-half as great as the defect to be filled, retaining the periosteum *in situ*. Care was taken that the connection between the section and the soft parts and interosseous ligament, so far as possible, should be retained. This fibula section was then passed through a hole made in the interosseous ligament and laid between the two freshened tibia fragments. Fixation was afforded by means of a plaster splint. Two years afterwards there was a beautiful result. Consolidation was rapid and perfect and the lad could walk as well as ever. Röntgenograms showed complete bony consolidation in which the graft was buried. The picture shows the gradual complete absorption of the graft and its replacement by new bone.

Stuckey reports a case of pseudarthrosis of both bones of the leg in the middle third. A large skin-flap with base above was formed, at the same time there was taken a bone-plate from the inner front surface of the tibia, after which the entire flap was swung upward. In the marrow canal was inserted a dowel *without* periosteum which had loosened itself from the tibia in the formation of the bone-plate. In the medullary cavity of the fibula was inserted a thin bone-plate.

See under clavicle, page 29, a case by Witzel in which he transplanted the spine of the scapula into the clavicle.

TECHNIQUE OF AUTOPLASTY WITH PERMANENT PEDICLE

1. Ollier's operation *par renversement* (Fig. 2). Expose the ends of the bone and excise the fibrous tissue between them. With a fine saw cut from one fragment a thin slice of bone after freshening the opposite end. The slice of bone is hinged by the periosteum at the other end of the saw line. The triangular wedge of bone is then turned downward and its apex is sutured with chromic

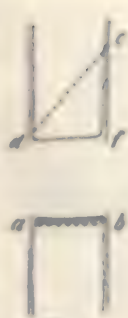


Fig. 2.

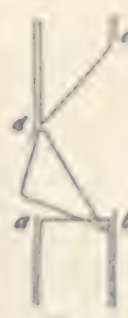


Fig. 3.

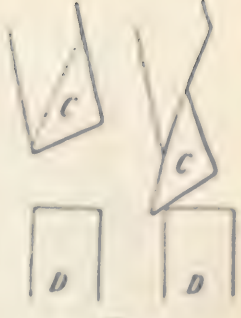


Fig. 4.

Fig. 2. Ollier's operation *par renversement*. A the osteo-periosteal flap, d is hinged at d and reflected down in B until f comes in contact at b .

Fig. 3. Ollier's operation *par glissement*. The triangle C is cut pedicled by the soft parts and reflected down and brought in contact with D.

Fig. 4. Ollier's operation *par implantation*, applicable only to two parallel bones. The triangle D is reflected over, pedicled by the soft parts, into the freshened sides of the opposite fragments. (From "Binnie's Operative Surgery.")

gut to the raw bone surface below, or it can be pushed into the medulla. As much as two inches of bone may be replaced by this method. The periosteum is the permanent pedicle.

2. Ollier's operation *par glissement* (Fig. 3). Freshen the end of each fragment and remove the fibrous tissue. From the upper end cut a triangular piece of bone with periosteum on it, but do not separate this portion of bone from its connection with the soft parts. Slide this piece of bone downward and suture it to the lower fragment.

3. Ollier's operation *par implantation* (Fig. 4). This is only suitable when one of two parallel bones is the site of a defect. The sides of the ends of the fragments are obliquely vivified opposite the bone from which the transplant is to be taken. These surfaces make two sides of a triangle. From the opposite healthy bone a triangular piece of bone is cut which retains its connections with the soft parts. The graft is turned and implanted into the defect, where it is sutured.

4. Müller's two operations. The first is made by turning the flap which consists of skin, periosteum, and bone, the pedicle being permanent. The ends of the fragments are exposed by a vertical incision which projects upward and downward, covering half an inch of the surfaces of each fragment. Remove all scar tissue interposed and freshen the ends and sides of the bone with a chisel. On the surface of the upper fragment outline a tongue-shaped flap, cutting through the periosteum with a knife. The pedicle, consisting



Fig. 5.

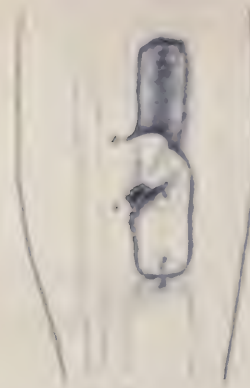


Fig. 6.



Fig. 7.



Fig. 8.

Figs. 5 and 6. Muller's first operation, made by turning the flap, the pedicle being permanent. (From "Hahn's Operative Surgery.")

Figs. 7 and 8. Muller's second operation, in which the twisting of the pedicle is avoided. (From "Hahn's Operative Surgery.")

of skin, is off to one side. With a chisel introduced through the upper flap incision cut a slice of bone corresponding to the skin incision. Rotate this flap so that it bridges the osseous defect and fasten the bone in the flap to the raw surfaces of the fragments with chromic gut. Undermine the edges of the upper defect so as to bring them together, or close it by Thiersch's grafts.

The second method of Muller is one in which the twisting of the pedicle is avoided. Make a V-shaped incision, the open part of the V being about two inches below the end of the lower fragment and projecting upward the same distance in front of the upper fragment. Carry the incision through the periosteum below and raise a slice of bone with the chisel from in front of the lower fragment. Elevate the flap, expose the defect between the fragments, remove the fibrous tissue, vivify with the chisel the ends of the lower and the front of the upper fragment. Carry the incision upward through the skin only on the surface of the upper fragment and loosen this part of the flap. Draw the flaps up until the bone in the flap bridges the defect in the upper and lower fragments. Suture the bone in this position. Carry the incision upward until the redundant portion of the upper part of the flap can thus be smoothed out. Undermine the edges of the lower defect and bring them together or Thiersch graft them. This operation has given Müller, Sprengel, and von Eiselsberg splendid results.

These operations are not of frequent applicability. If the defects are over 4 or 5 cm. they will be impossible. An objection which strikes one

is the increased liability to infection, owing to the Thiersch grafts, or to tension of the sides of the defect, as well as to the small raw surfaces which are liable to be left at the sides.

Müller has performed 13 of these transplantations for pseudarthrosis according to his method. Of these, 12 were very successful, consolidation quickly following. One only was unsuccessful, due to necrosis of the flap.

5. Hahn's or Huntington's operation: (See under tibia, page 35.)

CODIVILLA'S OPERATION

This consists in surrounding the pseudarthrosis with very thin osteoperiosteal plates taken from the internal face of the tibia. The periosteal sheets should be 3 to 4 mm. in thickness, and long enough to be fixed on each fragment by two sutures about 1 cm. distant. This method employed by Brade, Ranenbusch, Codivilla, and others, can be applied only to loss of substance no greater than 3 cm. It is the choice of method in congenital pseudarthrosis and it has been employed in some cases of acquired pseudarthrosis. Delagénière has transplanted an osteoperiosteal sheet as thin as a piece of paper which he has rolled about the pseudarthrosis, a procedure which has habitually succeeded with him. Codivilla has published a number of reports of patients operated upon by his method with success.

Streissler says that grafts of periosteum alone, as we have known for a long time, will produce new bone.

Brade of Breslau reports a case of pseudarthrosis with an osteomyelitic loss of substance of the tibia. Suture with silver wire surrounded by a

flap of periosteum without bone taken from the opposite tibia resulted in perfect consolidation.

IS PERIOSTEUM NECESSARY FOR THE SUCCESS OF GRAFTS?

This question has elicited the greatest amount of discussion and a wide variety of opinions have been given, backed up by animal experiments. The answer seems to hinge on the question of the presence or absence of the bone-cell from the deep surface of the periosteum. Some say that if, when the periosteum is removed, bone-cells adhere to its deep surface, then the periosteum will produce new bone; if none adhere, then the periosteum will not produce new bone. Is not this splitting hairs, for what is the *bone-cell* under the microscope? Can it be differentiated in any other way than by what it *produces* from the connective-tissue cells? Is it any more than a highly specialized connective-tissue cell? The periosteum is a connective-tissue membrane, hence why should it not produce the more highly developed bone-cell?

Axhausen attributes to the periosteum the first place in osteogenesis, second, the marrow retained on the graft, and third, the bone building tissue of the surroundings.

Lobenhoffer examined microscopically the periosteum in a transplanted human fibula graft, eighty-six days after the transplantation. As a result he is convinced, as many others are, that the bone tissue of the transplant dies and only the periosteum remains alive which is the foundation for the new formation of bone and the final replacement of the dead bone by living new bone. He took a microscopical section of the graft and found that the periosteum alone of the graft had produced new bone while the bone tissue of the graft was in the way of necrosis and progressive absorption.

In the beginning of this article the authorities have been cited who do not believe in the osteogenic properties of the periosteum. It will be instructive to see why they draw this conclusion. Gallie and Robertson, Bancroft, Davis and Hunnicut, Murphy, Brown and Brown, and finally, Groves have never made a reported human transplant *without* periosteum. The opinions of most of these authorities are based solely on animal experimentation and the remainder on conclusions drawn from human transplantations *with* periosteum. The question at once comes up why have not these surgeons made human transplants *without* periosteum if the periosteum has so little function? A careful search of the literature by the author reveals very few reported

transplantations made *without* periosteum. These are as follows: Baschkirzew cites a successful case, after four years, of transplantation without periosteum.

Wetherill also reports a successful case as follows: A graft was taken from the opposite tibia without periosteum and transplanted into the medullary cavity above the affected tibia and spliced to the lower fragment. Six months later, despite suppuration, röntgenograms show that the graft has lived and has increased in size.

Delbet has followed by frequent röntgenograms during more than a year an intra-osseous graft from the tibia without periosteum, 9 cm. long. The fragment has always been clearly visible, it has preserved its form, its dimensions, and its opacity. The proof that it is not dead is that it became fractured and that this fracture became well consolidated.

McWilliams has made four human transplantations without periosteum, and all these grafts became speedily absorbed. These cases have already been published. The first case had a piece of rib without periosteum grafted into a defect in the lower jaw. In five months the rib had entirely disappeared. The second case had a piece of rib without periosteum grafted into the inguinal canal to strengthen a hernial repair. In four months the rib was entirely gone. The third case was originally one of an infected compound fracture of the humerus with necrosis and non-union. After the sinuses were all healed, a rib without periosteum was grafted into the medullary cavities of the fragments. After nine months there was no union and the rib was honeycombed and showed no regeneration of new bone. The fourth case was non-union in a birth fracture in a child. Into the defect was transplanted a piece from the opposite tibia without periosteum. It was inserted into the medullary cavity of the upper fragment and spliced to the side of the lower fragment. The graft gradually melted away in the tissues, so that after six months it was not more than one-quarter its original size. All these four cases healed by primary union, so that one can say that there was lacking some element to produce osteogenesis. It seems reasonable to assume, consequently, that, since the periosteum was all that was wanting in these four cases, it is the periosteum which conduces to osteogenesis.

McWilliams questions very much whether the results of transplanting bone in dogs can be transferred to human beings with as exact a similitude as most experimenters have maintained. Non-union of a fracture among animals is a great

rarity, if not almost unknown, while quite the contrary condition prevails among human beings. Is it not irrational for a surgeon to make transplantations in the human being *with* periosteum and after these grafts have lived to maintain that the periosteum has had little to do with the life of the grafts when he probably never has made a transplantation *without* periosteum in the human being, as the paucity of such transplantations in the literature will testify. Probably many more have been performed *without* periosteum and because of their failure have not been published.

Jakel gives his results of injecting emulsions of periosteum in animals. The injection of an autoplasmic periosteal emulsion in 10 experiments gave a new bone formation more or less considerable, 6 times. The injection of an homoplasmic emulsion of periosteum can also cause a new bone formation but with less constancy (2 of 6 experiments) and less intensity than autoplasmic injections. Heteroplasmic periosteal emulsion injections constantly gave negative results.

It is interesting to observe the different results obtained by various operators as a result of transplanting *periosteum alone in animals*. The utter confusion existing as to the exact composition of the periosteum evidently explains the differences in the results because of the variations in method of the several operators in obtaining periosteum. All operators have neither included nor excluded the same components, due to the varying methods of removing the periosteum.

The following table shows these differences:

Operators who have produced new bone in animals by transplanting periosteum alone:

Tschi.	Haas.
Carrel.	Schepelmann.
Pachhammer.	Ryerson.
Biercher.	McWilliams.
Jakel.	Meyer and Wehner.
Nakahara and Dilger.	

Operators who have produced no new bone in animals by transplanting periosteum alone:

Gallie and Robertson.	Baschitzew and Petrov.
Davis and Hammett.	Macewen.
Brown and Brown.	

Macewen transplanted small bone chips without periosteum in a humerus with successful result. The details of this case will be found under the method of bone transplantation with small chips. (See page 13.)

Vallas, in a pseudarthrosis of the tibia, transplanted into the defect 10 to 12 small chips taken from the superior fragment. Consolidation resulted in six months.

RESULTS OF INFECTION ON BONE-GRAFTS AND THEIR USE IN INFECTED AREAS

The original idea that transplants should be grafted only into clean uninfected wounds must be somewhat revised, according to the latest clinical evidence, as well as the idea that infection necessarily means the death of the whole graft. If the graft be *without* periosteum it will probably entirely die. If it have periosteum on it, then there may be a superficial necrosis of the bone but the periosteum may furnish sufficient blood to the bone of the graft to cause a greater resistance than it would have without the periosteum, consequently less of the bone will die. There may be some superficial necrosis which either the periosteum or the surviving bone-cells of the graft will regenerate. The chances however, are, more than ever that the graft may entirely die.

Lewis has emphasized the effects of infection in the two following cases. The first one was in a patient who had some plates put upon an ulna and radius with infection and sequestration of each. In the operation and removal of dead bone so much radius was removed that subsequent radial deviation of the hand was feared and a transplant (with periosteum) was removed from the tibia and inserted into the defect to act as a mechanical support. Even if it had been necessary later to remove the graft it would have served a useful purpose. Later, two small sinuses formed and several small cortical sequestra were removed. Union was firm in six months. The second case sustained a compound infected fracture of the radius, from which a tubular sequestrum was removed. In order to prevent radial deviation of the hand, a transplant measuring about four inches in length was at once removed from the anteromedial surface of the tibia and transplanted into the defect and the wound drained. A sinus remained about the wrist for some time, but later closed without any sequestration. The transplant, as shown in the roentgenograms, has apparently increased in size and has survived in the infected wound.

Lewis remarked about these cases: "Bone-grafts inserted into infected fields will live, and even if sequestration formation occurs, necessitating operation later, they have acted as a mechanical support, preventing deformities, and the convalescence is materially shortened. Infection introduced at the time the graft is inserted has a much more harmful effect and the entire graft or the greater part of it is apt to be lost. The autoplasmic graft used in the treatment of old compound fractures, as in the last two cases

cited, seems to have developed a certain amount of immunity to the infection, or perhaps the virulence of the infection has been greatly reduced.

In a case reported by Athausen, an attempt had been made to replace the upper end of the humerus after resection for recurrent cancer by a metatarsal bone. A mild infection occurred, and in spite of the fact that the transplant was surrounded by pus total sequestration did not occur. Sequestration of the head of the bone resulted but the shaft healed in position and a firm union was established between it and the shaft of the humerus.

Klapp reports a case by Bier, in 1897, who removed the whole diaphysis of the humerus with the greater part of the periosteum for sarcoma. Subsequent to transplantation of a graft from the front surface of the tibia, two fistulae subsequently developed and finally there was sequestration of a fragment 3 cm. long and 2 cm. broad. Twenty-two months after operation there was complete consolidation with the formation of a complete shaft.

Von Mangoldt reports a case of non-union resulting from osteomyelitis of the tibia. After it was healed, he joined the fragments by a wire and interposed a graft taken from the opposite tibia. A fistula developed with sequestration. Consolidation was finally perfect.

Von Bramann reports transplanting a graft from the tibia to fill up a 7-cm.-long total defect in the humerus resulting from a comminuted fracture. Notwithstanding suppuration, fistulae, and extrusion of a small sequestrum, the humerus consolidated perfectly in three months.

Curtillet in a pseudarthrosis of the tibia transplanted a segment of the adjoining fibula which was pedicled by a muscular flap carried through the anteromuscular mass and fixed in the defect in the tibia. Consolidation was perfect in spite of suppuration requiring incisions.

Lambotte in a case of pseudarthrosis of the left tibia transplanted a free osteoperiosteal flap from the right tibia and fastened it to the freshened sides of the fragments by screws. Consolidation was complete below; slight suppuration above caused delay but finally there was complete consolidation.

Heidenhain in an osteomyelitic loss of some of the tibia transplanted an osteoperiosteal flap from the opposite tibia. Consolidation resulted in spite of suppuration and sequestration.

Wetherill also reports (See page 19 of this article) a successful graft made without periosteum, which, despite suppuration, lived and increased in size. He states that even the limited,

low grade infection which occurred at the lower extremity of the graft where there was splicing only between the fragments, which infection still persists (six months after operation), has not interfered in any way with union between the graft and the diaphysis and, though the union at the upper end was uninfected, it is not so firm or satisfactory. It would seem that this infection had stimulated osteogenesis rather than diminished it.

Tomita reports a case with bullet wound in front of the inner surface of the junction of the middle and lower thirds of the right leg. Suppuration and sequestration followed, requiring incisions and drainage. The wounds finally healed, leaving a defect 6 cm. long with abnormal movability. The defect was filled with a 8-cm.-long by a 2-cm.-wide graft, removed with periosteum and marrow from the upper fragment. This graft was implanted into the medullary cavities of the fragments. Drainage was instituted, but the wound became infected and the edges separated producing a large granulating cavity, at the bottom of which a 2 to 3-cm.-long bone-graft lay. Out of this area finally sequestered a small superficial piece of the graft, after which the wound promptly healed. Firm consolidation resulted, and the patient was walking without crutches the twenty-third week.

Brentano reports a case of pseudarthrosis of the left arm in which several operations had been done unsuccessfully. There was a 6-cm. shortening, and a graft with periosteum from the patient's own tibia was implanted between the freshened bone ends. Fixation was made solely through periosteal sutures. Drainage was instituted. Several months after the operation an abscess developed in the scar, which only healed when a small finger-sized sequestrum was discharged. The convalescence was also disturbed by erysipelas. Despite these complications, the implanted bone has not been extruded but has healed in; yet, after six and one half months, it has not attained a firm consolidation between the fragments.

Murphy reports having severe suppuration in two cases about the grafts, but with the aid of autogenous vaccines and the resistance of the patient, asepsis was again attained and the grafts survived.

Hashimoto reports a case of comminuted rifle wound of the humerus which suppurated. Removal of the fragments left a defect of 2 cm., which was filled with an osteoperiosteal segment from the patient's tibia, the fragments being first united with silver wire. The periosteum of

this graft was fixed to the humeral defect by cat-gut. The wound suppurated but there was no sequestration. It finally healed, with firm consolidation. Röntgenograms taken 19 months after grafting showed extensive new growth of bone with firm consolidation. Hashimoto also reports a second bullet wound of the arm with comminution. Suppuration and removal of fragments left a defect 3 cm. long. The fragments, after healing of the wound occurred, were united by a silver wire and an osteoperiosteal piece of the patient's tibia was placed in the defect and periosteum was sutured to periosteum. The wound suppurated, and the silver wire was extruded but there was no sequestration. Röntgenograms taken three months later showed an increase in the bone of the graft with some movement between the fragments.

A successful case combining a heteroplastic transplantation of a kid's bone with a homeoplastic graft from an asphyxiated new bone fetus is given by Poncet on page 10. The grafts were transplanted into a granulating defect in the tibia.

Schulze-Berge resected in a 20-year-old patient the upper tibial third for spindle-celled sarcoma, freshening the femoral condyles and the fibula as in a knee resection. He transplanted into the 8-cm.-long defect, a corresponding piece from the fibula of the healthy side. In the beginning there was suppuration, but the wound healed and the graft after a year reached the thickness of the tibial shaft below. The leg was almost ankylosed, there being but a small movement backward and forward. The patient walks easily with a protecting apparatus and a shoe heightened 2-cm. with the sole.

Stuckey reports the following cases:

Case 7. Pseudarthrosis of the middle third of the femur. An 8-cm.-long bone dowel (periosteum not mentioned) was placed in the defect which was taken from the tibia of the same leg. The fragments were united by two bone sutures (material not mentioned). Drainage. Splint. Fistula developed after the operation, out of which on the eighteenth day, a small sequestration was extruded. On the one hundred and twelfth day a bone suture was removed. The fistula closed on the one hundred and fiftieth day. Complete consolidation resulted six months after operation. Case 8. Pseudarthrosis and osteomyelitis of a fracture in the middle third of the humerus. Three weeks after the healing of the fistula, the ends were freshened and a 5-cm.-long bone dowel with periosteum and marrow was inserted into the medullary cavities. Drain-

age. Suppuration followed. On the eighty-eighth day after the operation some small sequestra were removed. The fistula closed on the one hundred and fifty-seventh day with almost complete consolidation.

McWilliams' reports two successful cases of bone transplantations from the tibia into defects in the lower jaw (see page 27). Examinations subsequent to that report show that both these grafts have lived. As to the action of the infection on grafts, these cases are very instructive. In the first of the cases the mouth was not opened in making the transplantation. Metal sutures were used. A slight serous discharge appeared on the seventh day, which became purulent. This was persistent, so on the fiftieth day after operation both wires were removed. The anterior one only was infected. This discharge persisted from one anterior sinus, consisting only of a drop in the mornings, for eight months, when it entirely ceased. There was evidently some slight molecular necrosis of the graft though no bone was ever apparent in the discharge. This necrosis was apparently due entirely to the wires, which were left in 50 days, despite the discharge, for support of the graft. How much infection had to do with the necrosis is a question. Certainly there was very little virulence. In the second case, the mouth was evidently opened at the time of the operation, although this was not appreciated at that time, for the graft became entirely dead and was extruded of itself from the sinus. This shows what an effect on a graft virulent infection has when it is introduced *at the time* of the grafting from the outside.

Fig. 9 is a röntgenogram of the autogenous graft with periosteum of Case 1, taken September 1, 1915, nine months after the grafting. It absolutely proves that infection does not necessarily mean the death of the whole graft. This picture was taken one month after the one interior sinus, which had for eight months discharged but a few drops in the mornings, had completely closed. At E, situated in the anterior part of the graft, is seen a light area evidently the seat of the necrosis of the graft. It comprises a scant half of the graft transversely and three-fourths of its vertical diameter. The remainder of the graft is very much alive. There are seen small metal particles both in the anterior and posterior parts of the graft, evidently some remains of the wires which had been previously removed. How these became disassociated from the wires themselves is hard to tell. At the present time they are causing no trouble. The ends of the graft have united

solidly to the fragments in front and behind. The motions of the jaw are normal and the patient can chew without discomfort.

Lewis reports a case in which a compound fracture of the tibia was at first wired and then later a Lane plate was applied which was removed in fourteen weeks because of infection. A sinus remained and non-union persisted. Lewis operated, encircling the sinus and exposing the fracture whose ends were transversely freshened. Each fragment was grooved for the graft which was taken from the tibia itself. Healing without suppuration occurred, the small discharging sinus closing within ten days. Consolidation was slow but finally perfect and roentgenograms indicated that the graft was alive.

Oechsner reports a case of defect in one tibia in which a graft was transplanted from the opposite tibia. The ends of the graft were tacked to the ends of the fragments by nails. There was ultimate suppuration which continued for two months when the wound was opened and several pieces of dead bone were removed as well as the two lower wires. Despite this suppuration roentgenograms demonstrated that regeneration went on uninterruptedly. From a third case reported, Oechsner draws the conclusion that bone transplantation should not be attempted in acutely infected cases. His patient, 6 years of age, had had osteomyelitis six weeks previously. A large volume of the upper surface of the tibia was removed, and, in order to expedite healing, the gap was filled in with a graft taken from the opposite leg. Infection occurred and the life of the patient was threatened. The graft had to be removed in the course of a month but the patient ultimately recovered.

Barnes reports what he claims to be a new procedure in a crushing (automobile) injury to the lower part of the foot. There was a compound, comminuted fracture of the tibia and fibula 2 inches above the ankle-joint. After careful iodine disinfection, the fracture was exposed. Many small fragments without periosteum were removed. One fragment 5.5 by 0.5 inches was removed without periosteum and was preserved. This fragment was found to be long enough to span the gap in the tibia. All the loose bone was removed from the wound, and the removed large fragment was replaced in the medullary cavities of the fragments, being fashioned by chromic gut catgut sutures. There was no periosteum on the fragments. The first dressing was made on the tenth day. There was slight serous discharge but within three weeks the entire wound had healed by primary union. Consolidation at both



Fig. 9. McWilliams' case of autogenous graft with periosteum into the lower jaw. It was taken nine months after the grafting, and illustrates the fact that infection does not necessarily mean the death of the whole graft if periosteum be on the transplant, for this graft became infected about one anterior metal suture. The suture was removed. The discharge lasted for eight months with the result that E represents only a limited portion of the graft which necrosed. At C and D the graft has perfectly united with the fragments of the lower jaw. It will be interesting to see if E will regenerate and fill up with new bone. The patient has perfect function of the lower jaw.

ends of the graft went on uninterruptedly and roentgenograms demonstrated at successive periods the active regeneration and enlargement of the graft, the last pictures being taken seven months after the operation.

SKULL

Heteroplastic operations on the skull. Reynier has found a few cases on record in which a large gap in the skull was closed by a plate of bone taken from a dog or other animal, but in none of them is the ultimate outcome known, although the results were eminently successful at first. He reports a case from his own experience in which he repaired an extensive breach in the skull from a shell wound by implanting a piece of bone taken from the scapula of a rabbit, with its periosteum. It was cut to fit the gap and the periosteum of the patch was sutured to that of the skull around. The outcome to date has been perfect.

Sternum flap to close gap in skull. Muller comments on the drawbacks of taking a flap from the skull itself, the harm done the brain by hammering and chiseling on the skull, the unevenness liable to be found when a flap is twisted around, and the difficulty of cutting a flap just the right size. These disadvantages are obviated by securing a flap elsewhere, and the sternum is especially adapted for the purpose. It is easy of access and the spongy structure permits a flap to be readily sealed off. He has applied the method in two cases and was surprised at its advantages. In one case he used a sheet of fat to substitute the dura; over this he fitted the sheet taken from the sternum, setting it in the gap which it smoothly filled; it soon bent to conform to the curve of the skull. The defect measured 2.2 by 6 cm. The work was all done under local anesthesia.

Schroeder has successfully transplanted a piece of the scapula into the skull.

Rhodes reports four cases treated by grafting rectangular grafts from the tibia with periosteum and marrow into defects in the skull.

Tomlin calls attention to the remarkable rapidity with which the periosteum of a graft unites firmly to the surrounding soft parts. In a skull defect he transplanted a piece from the tibia with periosteum. This piece was pushed up by the prolapsing brain. On the third day skin sutures were taken away. The wound edges separated, the graft remaining firmly attached by its adherent periosteum to the surrounding skin.

The covering of large defects in the skull by celluloid plates. Funke¹ says that in all small defects of the skull the autoplatic graft is to be preferred above all other methods. In large defects it is almost impossible to form a single large bone shell to answer the purpose. Usually it must be broken into several pieces, which when the dura is intact, may give rise to troublesome deformity. Celluloid plates heal in most cases without trouble and may remain many years, seven years (Hinterstimmer), eight years (Frankel). Funke had one case which caused trouble after ten years. A sinus developed. At operation to close the persistent sinuses, the plate was found broken in several places and its consistency was changed.

Clak of Petrograd² says that in fractures of the vault of the skull, the best method of autoplasty consists in reimplanting the removed fragments. In 20 such procedures he has had 15 complete successes, one unsuccessful because

of extrusion of the infected fragments, and 5 died because of suppurative meningitis in patients operated on at the end of two or three days who were already profoundly infected.

NOSE

A number of methods have been employed in forming a new nose. Lothrop's method is as follows: A strip of bone, 2 inches long and about .04 of an inch wide, was removed by Lothrop from the free vertebral border of the scapula with bone-cutting forceps and wrapped in wet, sterile gauze. The attachments of the muscles were first cut from the border and from the external and internal surfaces, great care being taken not to denude the bone of its periosteal covering. A subdermal passageway was made in the nose bridge extending to the distal extremity of the nasal bones. At this point the periosteum of the nasal bones was cut and elevated along the crest of the nose bridge up to the frontal bone. The nasal bones were then ground down with a rasp, the graft being inserted through this passageway and under the periosteum until the end reached the frontal bone. In three weeks the graft was quite solid and in four weeks it was very rigidly held in place on the nasal bones and the dressing was omitted.

Carter has devised the best method of correcting a saddle-nose where the soft parts are intact, the bony framework being gone. His description is as follows: A curvilinear incision, convexity downward, is made between the eyebrows, extending down to the periosteum over the frontal bone. Lifting the flap up, a transverse incision is made through the periosteum and into the bone. This incision is at a point just below the glabella. Above the incision the periosteum is elevated for about three-eighths of an inch. With a sharp elevator the skin and subcutaneous tissues are then elevated over the dorsum of the nose, to an extent corresponding to the degree of the deformity, over the sides of the nose and in some instances over the cheeks. If any of the nasal bone is left its periosteum should be elevated so that the bone-graft, when it is introduced, will lie in close contact with the raw bone and its torn periosteum. Two inches of the ninth rib are then removed, preserving the periosteum on the outer surface. This piece of rib is then split in its transverse diameter, the outer half being shaped to suit the deformity. The bone-graft is then inserted nearly to the tip of the nose, and the upper end is carefully placed beneath the periosteum over the frontal bone. The semilunar flap is then brought down to its

¹Zeitschrift f. Chir., 1903, 40, 121.

²J. de Chir. 1902, Nov., 130.

place and the wound is closed with horse-hair sutures.

Israel made a new nose by bringing the forearm up to the head where it was held by a plaster. On the ulnar side of the forearm he formed a flap pedicled toward the elbow. He then chiseled out of the ulna a piece of bone which he left attached to this flap. The pedicled flap was then sutured in place, the bone in it acting as a support for the new nose.

Several operators in making a new nose have tried the preliminary inlaying of one or two thin bone-plates (taken from the tibia), under the skin of the arm or forearm. After these have healed in place, a large pedicled flap is circumscribed about them and the raw surface of this flap is skin-grafted. Later this pedicled flap is bent like a roof as near the transverse configuration of the normal nose as is possible and is sewed by its edges into the defect in the nasal structures.

Lexer has attempted to make a new nose in an ingenious manner. He saws from the anterior surface of the tibia (where it is triangular in cross-section) a piece of bone of appropriate size. This is then slipped under the skin of the arm or forearm where the hair is nearly absent, and allowed to remain there for three or four months until the skin and bone have united quite firmly. In another still freer way, Lexer made a rhinoplasty in which he made a whole scaffold for the nose from the lower epiphysis of an amputated femur. The *Gelenknorpel* formed the bridge and the tip; the side walls of the new nose were made of spongiosa, while the interior of the future nose was bored out with the "fraise." This bone transplant was put under a thin layer of skin in the forearm, which covered it on the outside, while its inner side was covered by a flap of the muscle. After this substitute nose had healed for several months in the arm, it was transplanted to the face.

Abbe¹ exhibited a patient showing the result of completed plastic repair, following extensive removal of cancer of the nose. The entire surface of the nose from between the eyes to the nostrils and from cheek to cheek was eaten away. In closing the defect preference was given to the double transplantation flap method of Steinthal on account of the ample flap to be obtained. Two vertical incisions, five inches long, three inches apart, were made over the upper sternum, the lower ends being joined by a cross-cut and a thick flap raised which included periosteum and a strip of bone chiseled up with the flap. The left fore-

arm was brought up so that the hand rested on the right shoulder, and an incision was made in the skin of the forearm, corresponding to the lower edge of the sternal flap. Close suturing of this flap edge to the edge of the forearm cut was made and the arm and hand fixed to the chest and shoulder by adhesive and plaster-of-Paris dressing. In two weeks the nutrition of the chest was well sustained from the forearm end, permitting division of the upper end from the sternum. Three days were given to promote the best circulation from its forearm attachment and it was then stitched by its freshened edges to the freshened edges of the nose defect, and the forearm fixed to the head by laying the hand flat on a previously applied helmet of plaster-of-Paris. The entire forearm, shoulder, and head were encased in a light plaster-of-Paris bandage. The patient fed himself, as his mouth was free below his fixed hand. In eighteen days the flap had acquired ample nutrition from his face and it was cut away from his forearm. It had a fine vascularity after this second transfer and was then stitched throughout its entire margin to the nostrils and cheeks. Two minor subsequent trimming and suturing operations were done under local anæsthesia and an excellent living healthy ample new nose resulted. The advantage of this method for this case was in having unlimited freedom to cut away the disease, as a flap as large as necessary could be brought up. The disadvantages of this method were: first, a tedious and almost exhausting confinement in plaster casings; second, a not altogether slightly though healthy ample flap repair. The disadvantage of these transferred flaps was that, being cut off from all their original margins, they lost their vasomotor supply and underwent some fibrosis, thus giving them a waxy unnatural pallor which contrasted with the skin of the face. This did not occur with the large flaps of the forehead, turned down on a pedicle between the eyebrows, which were fed by the supra-orbital and nasal arteries without loss of continuity and hence in proper nerve relations with the general vasomotor system. In proper cases Abbe prefers this so-called Indian method of forehead flap.

McWilliams suggests that this double flap method would be ideal in cases where a deficiency in the bone of the lower jaw, as well as a loss of soft parts of the overlying cheek, is to be supplied. The details of the operation would be the same as the above.

The method of forming a new nose by reflecting from the forehead a flap consisting of skin,

¹ Med. Rec., 1911, May 20, p. 921.

periosteum, and bone is well known and described in most textbooks of surgery. Morestin has transplanted a rib into the forehead, and, when this healed in place, a flap consisting of soft parts, containing the rib, was sutured in place in the defect in the nose. Streissler has reported two successful transplantations into nasal defects of bone taken from the forehead pedicled by the soft parts.

Carter has transplanted a rib into the forearm and then this was reflected with the soft parts as a flap into the nose. The pedicle was later divided.

Finney, McGraw, and McWilliams have each successfully grafted a finger into a defect consisting of all the structures of the nose. Baldwin has suggested an improvement of this finger transplantation. He reports two cases. The modification seems very advantageous. It consists in making a double layer of skin so that one layer would be continuous with the cheek while the other would take the place of the mucous membrane on the inside. To accomplish this a flap was made on the abdomen, reversed, and its raw surface then sutured to the raw surfaces on the finger made by reflecting flaps on its ventral surface. The pedicle was later divided and the finger was sutured to the nose. It was later amputated. The final result was "pleasing." McGraw could collect but eleven cases in which a finger had previously been used as a transplant into the nose.

Mandry successfully transplanted in rhinoplasty a skin-flap containing a section of the clavicle.

Streissler reports (Case 23) removing an extensive adenocarcinoma of the nose and nasal cavity. The defect consisted of the entire septum, the left half of the nose, the eye and its cavity and the adjoining part of the superior maxilla. For covering the defect, skin alone would not have sufficed, so a section with periosteum from the patient's tibia of sufficient size to fit the defect was removed. This was transplanted into the subcutaneous tissues of the forearm near the elbow by means of a longitudinal incision. The bone transplant healed in without reaction. One month later the edges of the nasal and cheek defect were freshened and to these edges was sutured a flap formed on the forearm with its base distally directed. This flap contained the bone-graft. The crest of the tibial graft formed the prominent anterior edge of the nose. With aluminum-bronze wire sutures, the graft was fastened to the adjacent bones above and below and the skin edges of the graft were sutured to

the freshened edges of the defect. The arm was fastened to the head by means of plaster bandages so that there was no tension on the flap. Sixteen days later the flap was divided. There was primary union of the entire flap, both skin and bone. The result was fine. Streissler has reported two additional cases (Cases 2 and 16) of plastic operations on the nose which were healed by reflecting flaps from the forehead consisting of skin, periosteum, and a small portion of bone into the defects. Later each of these cases had additional grafts from the tibia inserted. The results were good in both cases.

INTERIOR MAXILLA

In cases of loss of the soft parts of the cheek together with more or less bone of the lower jaw, the method given on page 25 by Abbe to supply bone and soft parts for a new nose, will be found very useful. By this method the defects both in the soft parts and in the bone can be supplied. The method consists in taking a part of the sternum, pedicled by the overlying soft parts, and transplanting these into the defect. The advantage of these pedicled flaps over free grafts is that the pedicled bone-grafts may be used in granulating cavities without fear of death of the graft, owing to the abundant blood supply through the pedicle. Free grafts will slough out.

Stillman uses temporary silver prothesis in the lower jaw after partial excision till he can transplant a rib. He has successfully grafted a section of a rib into a defect in the lower jaw.

Berndt has made, in a one-sided resection of the lower jaw, a prothesis out of celluloid. This prothesis was worn for four and one half years without reaction. There were no fistulae at any time. The mouth could be opened and closed comfortably.

Alessandri has used the prothesis of Chiavaro with good success after partial resections of the lower jaw.

Rydgier achieved, in 1892, a beautiful result after transplanting into a defect in the lower jaw a skin-pedicled piece of the clavicle which was sewed into the defect.

Bardenheuer and Krause have used pedicled periosteal-bone sections taken from the neighboring part of the lower jaw. Wolfer has used with a negative result a section from the clavicle hanging by a skin-flap, Bardenheuer a skin-periosteal-bone-flap from the forehead. Sykoff transplanted a free section from the neighboring part of the lower jaw. Payr advises the use of a periosteal-covered rib to fill in these defects in one of the two following ways:

1. Osteoplasty by means of a large rib section pedicled by the soft parts of the chest wall. A tongue-shaped flap containing skin and fascia is marked out on the chest, and into the apex of this is placed a section of a rib with periosteum. After two or three weeks the transference is performed, the edges of the soft parts being sutured to the edges of the wound and the ends of the rib-graft to the ends of the fragments of the lower jaw. The advantage of this method is that it can be done in the presence of an opening into the mouth, as a good blood supply will prevent injury to the graft by infection.

2. A second type of osteoplastic lower jaw replacement is by means of a free transplantation of a periosteum-covered rib section. At the first operation the resection is carried out, means being taken to hold the fragments in the proper alignment. At the second operation performed only after the closing of all sinuses, the rib is put in place by dovetailing it into the lower jaw fragments or by the use of metal sutures. For a case of a half resection of the lower jaw the section of the rib should be taken near the spinal column, and should contain the rib head. In cases with defects in the middle of the lower jaw, a median skin-muscle-flap with a section from the manubrium may be taken and inserted directly into the defect at the same time that the resection is made.

Payr in 1908 successfully performed three of these operations, two according to the first method and one according to the second.

McWilliams reports two successful cases of free, autogenous transplantations of sections from the tibia with periosteum into defects in the lower jaw. His conclusions are as follows:

First, the proper alignment of the upper and lower teeth must be maintained by suitable means. In my experience the best being the wiring of the upper to the lower teeth.

Second, no bone grafting should be done until all the sinuses are perfectly healed, so that no infection remains in the tissues.

Third, all the operative work of grafting must be done from the outside and the mucous membrane of the mouth must not be opened. This is to prevent infection of the graft. If, in making a furrow to lodge the graft and also while ironing the fragments, the mucous membrane of the mouth be accidentally opened, then at that time one should not insert the graft as it would most certainly be acutely infected and die subsequently. The upper and lower teeth should be held in their proper relations, thus preserving the defect intact. The infected wound should be allowed to heal before the graft is inserted. In my experience, if the graft is infected from the mouth at the very beginning, before the circulation has been established in the graft, it will certainly mean the death of the whole graft. (See Case 1.) This is not necessarily true of a more or less sluggish infection which comes on late about a wire suture. In such instances of late infec-

tion, there may be necrosis of a small portion of the graft, but it need not necessarily entirely die, if it has a good blood supply. (See Case 1, page 21, Fig. 9.)

Fourth, the graft should always have periosteum on it and it should be taken from the patient himself who is to be grafted, preferably from the tibia. The crest of the tibia should never be taken as a graft, as this so materially weakens the bone that a fracture of the tibia is liable to occur subsequently. This occurred in both my cases. The anteromedial surface of the tibia can safely supply a graft.

Fifth, the graft should not be touched by the gloved hand at any stage of the operation. It should be handled entirely by sterile instruments.

Sixth, the general surgeon should have the help and advice of a skillful dental surgeon in those cases of osteomyelitis and necrosis of the inferior maxilla.

Seventh, the following conclusions were added subsequent to the appearance of the report: In the light of later experience, I would avoid metal sutures altogether, if possible, using chromic or kangaroo-gut, since asepsis in such a location is difficult to attain at the very best and it is consequently wise to avoid implanting any irritating substance. If possible, dovetailing of the graft into the fragment is the best procedure, using gut simply to prevent dislocation. Periosteal sutures alone are not of much use in this location.

Eighth, if because of suppuration the graft dies, the grafting should be repeated, if necessary, a number of times until success is achieved.

In McWilliams' first case (see Fig. 9) there was slight secondary infection of the graft which did not injure its life in the slightest. This infection soon subsided on removing the metal suture. The mouth, during the transplantation, was not opened in this case. On the contrary, in the second case the mouth was opened at the time of the transplantation, although this was not appreciated at the time of the operation, which resulted in the extrusion of the whole graft due to the infection. There are a number of reported instances of failure of the graft to live when grafted into the defect in the jaw when the mouth was opened during the transplantation. Thus, Abadie reports a transplant of a rib in a case of resection of the lower jaw immediately after he had resected a portion of the jaw, the mouth being necessarily opened. The graft extruded itself in two months as a result of suppuration. At the Mayo clinic there was a similar result.

Vorschütz made an immediate transplantation, after resection of the lower jaw for carcinoma, of a section of the tibia with periosteum. The mouth was shut off from the graft by silver wire sutures. Removal of a large sequestrum, which consisted of the entire transplant, was subsequently done on account of persistent suppuration. Case 2 consisted in resection of part of the lower jaw and closure of the edges of the opening in the mouth, followed by immediate transplantation of

bone-graft taken from the tibia with periosteum, and fixation of the ends with silver wire sutures. The wound suppurated violently, and because of persistent high temperature the dead graft was removed. Later reports of these cases showed some thickening as though the bone had been formed from the periosteum which had been left *in situ* after the removal of the grafts. These two cases bear witness to the uselessness of transplanting bone into a defect opening into the mouth. The ultimate results are not stated, but what should be done in such cases is to preserve the width of the defect by maintaining the teeth in proper occlusion by wiring them or by applying a suitable prosthesis until the wound is entirely healed and then transplanting. One can transplant as many times as is necessary to secure a living transplant.

Strömmer reports another case which illustrates the inadvisability of bone transplantation when the mouth is opened because of operative efforts made to reduce the displaced fragment. The case, a pseudarthrosis 2 cm. back of the mental foramen of the inferior maxilla, was operated on because of difficulty in chewing. In removing the connective tissue, freshening the edges, and replacing the dislocated fragment, the mouth was opened and the edges of the opening sutured. This was followed by the removal of a 4 cm. long section with periosteum from the under side of the opposite frontal segment which was interposed between the fragments and fastened with silver wire sutures. Two months later the necrotic graft had to be removed because of severe sepsis and profuse suppuration. The patient was fitted with various prostheses fairly successfully.

Göbell of Kiel reports two cases in which he transplanted free sections from two ribs with their entire encircling periosteum into defects in the lower jaw. The first case healed by primary union and was an almost perfect success. The second case came down with scarlet fever shortly after the grafting operation and, although the mouth was not opened during the transplantation, the wound suppurated violently, resulting in the extrusion of the graft. He says one may use a fragment from tibia, femur, sternum, and particularly the iliac crest. This last is to be particularly recommended when it is a question of fashioning a new chin, for the crest of the ilium can be fashioned so as to resemble the curves of a normal chin. He makes a great point of taking away with the graft enough periosteum to entirely cover the graft, which, according to McWilliams' cases, is not necessary, half the sur-

face periosteum being all that is requisite. Göbell says when the patient is a young infant, the graft may be taken from the mother or father.

Hardenheuer transplanted into a defect in the lower jaw a metatarsal bone which later had to be removed because of infection.

Faan has succeeded in constructing a fair chin in a case of undeveloped jaw following ankylosis of the temporomandibular joints in childhood. The first step was excision of the articulation and interposition of temporal fascia. Three weeks later he resected 12 cm. of the eighth rib, undermined the soft tissues of the chin, sawed through the mandible in the mental region and inserted the section of rib, which was bent to resemble the chin.

For a successful case of prosthesis in a resection of the lower jaw see Heller's¹ report, in which is given the literature on these prostheses. The patient cited had worn the prosthesis comfortably for two years.

Oppel reports a complex autoplasty to repair a considerable loss of tissue of the face and lower jaw for sarcoma. It was necessary to remove the lower lip, the entire horizontal portion of the inferior maxilla, the submental and submaxillary tissues, the floor of the mouth and a portion of the genioglossus muscle. The saliva ran from the mouth unceasingly, while the patient could neither speak nor nourish himself comfortably. After waiting till after cicatrization was complete, the following grafting was done: From each of the two clavicles, an osteoperiosteal section 6 cm. long comprising half of the thickness of each bone was taken. These two fragments were then implanted under the skin of the middle of the neck, so placed as to make a bony arcade. The grafts succeeded so well that the two contacting internal extremities of the grafts consolidated together. A large cervical flap with convexity below was fashioned, containing the osseous arcade. This flap was lifted up from below and sutured by its lateral borders to the freshened borders of the cheek in such a way that the cutaneous surface formed the floor of the mouth, its free border being rolled around so as to cover the bone-grafts and to form the free border of the lower lip. An attempt was made to cover the raw surface by a Krause cutaneous graft but this became gangrenous. It was necessary to make two flaps in the shape of an epaulette with a superior pedicle, which were united around the neck like a shirt collar. Finally, in order to diminish the dimensions of the buccal orifice, which were too large, it was neces-

¹ Deutsche Zeitsch. f. Chir., 1908, vol. 65.

sary to make a part of the lower lip at the expense of the upper lip and of the cheek. The final result obtained was very satisfactory; the patient can speak clearly but is much troubled by the drooling of saliva.

THE SPINE

Pott's disease of the spine. One of the most successful of all bone-grafting operations is that performed for tuberculosis of the vertebrae. For a further description of this see any good textbook of surgery.

Spina bifida. Albee has reported several successful graftings made for this condition. The operation is very similar to his grafting operation for tuberculosis of the spine.

Trout, in May, 1915, reported making a remarkably successful bone transplant from father to child in a case of spina bifida. The sac was opened, drained, and then closed with a catgut suture and shoved back into the cleft. A bone-graft was taken from the father's tibia and placed over the cleft, where it was anchored with chromic gut sutures passed through the periosteum of the graft, the cartilage of the transverse and spinous processes, and any other firm structure the curved needle would grasp. Four months afterward the growth of the graft was seen to be very extensive and could be readily felt.

CLAVICLE

Witzel reports a successful case of transplantation of the spine of the scapula into a defect made in the clavicle because of the removal of a tumor. An epaulette-shaped incision was made about the shoulder, followed by resection of the outer portion of the clavicle at the junction of its middle and central thirds. The spine of the scapula was separated from the supra- and infraspinati and was chiseled loose with a portion of the body so as to form a relatively broad base. The spine was swung around forward and loosened so much that there was no drag on it and its central end was fastened to the central clavicular end by silver wire sutures. After consolidation the wires were removed because of a small discharge. Seventeen months afterwards, the movements were normal and there was no hindrance in the free use of the shoulder. Consolidation was perfect. The object of this graft, which was to prevent the falling inward of the shoulder, was attained most satisfactorily.

HUMERUS

Duval in a case of subcoracoid dislocation of the head of the humerus resected the head and

transplanted into the upper end of the shaft of the humerus the head of the metatarsal bone resected for hallux valgus in the same patient. The long head of the biceps was divided and the metatarsal was sutured to the humeral shaft with catgut. It filled well into the glenoid which was exposed after removing its covering of fibrous tissue. The final result was satisfactory.

Bier removed in 1897 the entire diaphysis of the humerus together with the periosteum for sarcoma. The defect was replaced by a portion of the tibia including both periosteum and marrow. In 1912 X-rays showed that the tibial transplant had developed into a normal shaft with a central medullary cavity.

Braun resected for cysts two-thirds of the humerus with the head of the bone. The defect was filled in by a section from the tibia, with good result. Two years afterward the arm showed no abnormality outwardly. A second similar case also resulted favorably.

Borelius reports two cases in which the upper end of the humerus, including the head, was resected and was replaced by the upper end of the fibula. The functional results were good.

Axhausen successfully replaced the resected head of the humerus by the head of the second metatarsal bone.

Gask resected about half the diaphysis of the humerus for chondrosarcoma and filled the defect with a section of the whole diameter of the patient's fibula, each end being wedged into the corresponding medullary cavity. Seventeen months after the operation the arm was as good as the opposite normal one and X-ray showed that the fibula had increased to the size of the normal humerus.

Bardenheuer in a defect in the humerus made a tongue-shaped flap on the chest, and subperiosteal resection of a rib which was left attached to the flap which was reflected into the defect. There was division of the bridges in two months. Good union resulted.

Huguier has successfully transplanted sections from the fibula into the humerus in three cases. He states that in no case has he ever seen any weakening of the leg because of the removal of the fibula.

Codivilla tells of two successful cases of defects in the humerus filled by sections of the external border of the scapula pedicled by the neighboring muscles.

Stieda transplanted a graft, 14 cm. long, taken from the antero-internal surface of the tibia with periosteum and marrow into a corresponding defect of the upper part of the humerus. A cap

of the head of the humerus was preserved. Into this, one end of the graft was implanted and the other end into the medullary cavity of the lower fragment. No foreign substances were used; primary union resulted. Seven months afterward the patient could use the repaired arm as well as the one on the normal side and the graft had increased in size to that of the humerus below.

Brunetti says the fibula is the bone of choice in transplantations. He resected the diaphysis of the humerus for sarcoma and transplanted into the defect a 15-cm.-long graft from the fibula with periosteum. The graft was wedged in the medullary cavities, no bone sutures being used. There followed dislocation of the lower extremity which was replaced in a second operation, at which time the periosteum was found very adherent to the neighboring muscles. The final results were good and the patient had normal movements of the arm. Brunetti believes in taking bone from the individual himself, always with as much non-traumatized periosteum as possible and in the avoidance of any bone sutures.

Strodel reports three successful cases of transplantations from the tibia into defects in the humerus, and one case by a transplant from the fibula.

Sturkey reports the following two cases: In the first case, pseudarthrosis of the middle third of the humerus, a dowel from tibia *without* periosteum was inserted into the medullary cavities. Complete consolidation resulted in 31 days. In the second case, a pseudarthrosis in the lower third of the humerus, a dowel taken from the fibula *without* periosteum was inserted into the medullary cavities. Drainage was instituted and complete consolidation resulted after 45 days.

Davison reports three successful transplantations of sections from the tibia into the humerus.

Hashimoto and So report a case of pseudarthrosis in the right humerus. The fragments were sutured with silver wire, and an osteoperiosteal graft made from the tibia. The consolidation was perfect. They also report a case of pseudarthrosis of the humerus in which an osteoperiosteal tibial graft was inserted and sutured with silk. Profuse suppuration followed; there was no consolidation. They cite two further cases of pseudarthrosis of the humerus in which wire sutures and osteoperiosteal grafts from the tibia were used. In neither case was there perfect consolidation. In another case of a non-union fracture of the humerus, the fragments were sutured, and two osteoperiosteal grafts

taken from the two tibiae. There was no complete consolidation.

Hacker demonstrated by roentgenograms the filling of a defect in the humerus by a tibial graft. After six months the result was so good that the humerus was almost entirely restored and was scarcely to be distinguished from a normal humerus, as the medullary cavity appeared to be restored.

Bier's observations in December, 1912, were based on 16 transplantations of bone. The most striking of these transplantations was the replacement of the entire diaphysis of the humerus resected for sarcoma by a segment of the patient's tibia comprising the anterior half of this bone 20 cm. in length. The operation was performed fifteen years previously and radiograms showed the marvelous result which was obtained. Bier lays great stress upon the influence of the marrow in causing osteogenesis and advises leaving as much as possible of this upon the fragments.

Murphy removed 7.5 inches of the humerus with the epiphyseal line and the upper articular end and transplanted a correspondingly long section of bone from the tibia with its periosteum, the inferior extremity being placed in the medullary canal below while the upper end projected into the joint. The muscles were sutured to the grafts in their anatomical positions. The graft lived, the humerus becoming as large as a normal one and the extremity functioning almost perfectly. Except her inability to raise her arm up close to her head in an extended position, the patient is not reminded that any operation has been performed on her.

Fay resected the diaphysis of the humerus for sarcoma and transplanted into the medullary cavities of the fragments a 15-cm.-long section from the fibula. At the end of seven months union was complete at the upper end of the graft, but a pseudarthrosis existed at the lower end. The patient had perfect use of the limb and could even play the piano.

ULNA

Williamson reports removing an endothelioma from the ulna and filling in the defect with an autoplasmic bone-graft. The result was good.

Viannay reports a resection of the ulna for a periosteal osteosarcoma. The defect was immediately filled by a graft comprising only half the thickness of the fibula, which was split longitudinally. The ends were pointed and inserted in the medullary cavities of the fragments, the periosteum being sutured over the points of union. No other fixation was neces-

sary. The result was excellent after 17 months with motions perfect.

Tisserand resected the lower extremity of the ulna leaving the epiphyseal cartilage in place. A 10-cm.-long fragment from the patient's fibula with periosteum on two of its sides was implanted into the defect, being fixed by silver wire. The periosteum on two of its surfaces was left *in situ* in the leg to assure regeneration of the bone of the resected fibula. The result was excellent and the movements of the forearm were restored and the segment of the fibula regenerated.

Janeway resected 16 cm. of the ulna for chondrosarcoma. He transplanted into the defect a graft taken from the crest of the tibia with its periosteum. This graft was sutured by two metal sutures to the remaining extremities of the ulna. The periosteum of the graft was sutured to the periosteum of the ulna, primary union resulting. Fourteen months after the operation the result was beautiful. The graft had become united to the old ulna and was much increased in size. At the time of the transplantation the graft was but 3 mm. in thickness.

Streissler reports two cases of resection defects of the ulna successfully treated by transplanting grafts from the tibia.

RADIUS

Walther reports a case of defect on the lower end of the radius filled by a graft from the superior end of the fibula. The fibular head was applied upon the carpus. There were no osseous sutures but the remains of the articular capsule were sutured to the periosteum of the fibular graft. The result was very satisfactory, the graft reproducing the bone of the lower extremity of the radius and the motions of the wrist being very good.

De Gouvea transplanted the top of the fibula with periosteum into the lower third of the radius for sarcoma. The result was perfect after three months. He says: "The periosteum plays the most important rôle in the preservation of the bone and it is the principal factor in the consolidation of the graft."

Delagénière (de Mans) in a case of ununited fracture of the lower third of the radius, opened the medullary cavity, inserted a nail with the head removed; an osteoperiosteal graft, taken from the tibia, was wound about the fracture (very little bone on graft). Perfect consolidation resulted.

Tietze replaced the lower radius end, resected for sarcoma, by the first phalanx of the great toe

whose base was used for the joint surface. The patient was a violin player. Beautiful result.

Neumann transplanted over a year previously the distal 9.5 cm. of the left radius for sarcoma. The defect was filled at the same operation by a piece taken from the front cortex of the tibia. To prevent the atrophy of the free end projecting into the carpal joint and to prevent a near-throsis the periosteum at the joint end was taken in a right-angled flap which was made large enough to go over and cover the sawed raw end. The graft was implanted without any sutures being used. It has healed perfectly to the upper fragment and the wrist has again attained great movability so that the hand is fully useful.

The technique of choice in dislocation of the head of the radius is not to remove the head but to replace it if it is possible. Ashurst reports a successful case after such a procedure. Likewise, the treatment should be the same in dislocated heads of the humerus and femur, provided the heads are not septic. They should be replaced, even though they be dead but not septic (Murphy).

Piqué has partially resected the inferior extremity of the radius and filled the defect of 5 cm. by making a pivot about the interosseous ligament of a section from the neighboring ulna which he fixed to the radius by inserting the superior radial fragment into the medullary canal of the transplant, while below the union was made by means of a wire. Callus appeared very soon above with consolidation, while below there remained a slight movement. The functional result was perfect.

Lewis reports (Case 11) a compound, comminuted fracture of the radius with a great defect. It is an instance of how patience gained its own reward, for the patient was grafted twice with a final successful result. The first graft from the tibia became absorbed due to a hæmatoma which formed about the graft. It was grafted a second time from the tibia with a successful result.

HAND AND FINGERS (SPINA VENTOSA)

Haas in two cases made partial resections of the diaphyses of two phalanges and transplanted into the defects sections from the tibia with their periosteum. Both grafts lived and functionated well.

Müller in tuberculous osteomyelitis of the phalanges first removed the diseased diaphysis of the phalanx with its periosteum and then transplanted into the defect a piece of ulna which had its periosteum attached. In six out of eight cases the results were good. Even if the trans-

plant were implanted in tuberculous tissue, the graft healed kindly. The fixation was made in the extension.

Tsikel reports a case from Hardenheuer's clinic as follows: A girl, aged 12, showed a spina ventosa of the middle phalanx of the right index finger which did not improve under conservative treatment but progressed to fistula formation. June 9, 1896, under ether anesthesia, after the application of an Esmarch bandage, an incision was made from the middle of the end phalanx to 1 cm. above the metacarpophalangeal joint. The fistula was excised and the entire diseased phalanx removed; next the tendons were loosened up and the tissues surrounding the head of the first phalanx were cleared away. A wire was inserted through the phalanx near its end, after which a longitudinal piece was cut away from the side, leaving a small bridge of bone in the region of the wire. With the wire as an axis, this piece of bone was then turned over to occupy the gap left by the removal of the middle phalanx. The transplant was anchored to the terminal phalanx by means of a piece of wire. At the end of four weeks ankylosis took place at the first interphalangeal joint, but there was motion at the end joint and a good cosmetic result was obtained.

Pels-Leusden says that spina ventosa should be treated by excision of the diaphysis with its periosteum and the defect should be filled in with a graft taken from the tibia with its periosteum. Streisler reports two such successful transplantations.

Leonte made an osteo-articular graft in a case of spina ventosa. He removed the entire metacarpal and replaced it by the fifth metatarsal. Primary union resulted. After a year there was perfect function of the fingers.

Recently another method has been presented which makes use of the substitution of the whole phalanx of the toe for a diseased phalanx of the finger. The first of these cases was reported by Wolff in 1909. His patient was suffering from a spina ventosa of the basal phalanx of the fourth finger, which caused a considerable interference of motion. Under ether narcosis he removed the entire phalanx with some of the diseased tissue. He put in place of the removed phalanx the first phalanx of the second toe of the right foot, sewing it in with catgut. Into the defect of the foot he inserted a piece of cartilage from the sixth rib. At the end of one week he began active and passive motions. He reported a useful joint after a lapse of one year and eight months.

Nikoladoni has replaced a lost thumb by the

second toe. The toe is separated from its connection with the metatarsus so widely that it hangs only by a plantar flap of soft parts. It is then fastened to the freshened finger stump by means of bone and tendon sutures. After two weeks the pedicle is divided. The same operator has also replaced a destroyed thumb by forming a thumb out of the tissues of the chest and into this he has transplanted a piece of periosteum-covered bone from the tibia. When this graft was healed in place, he fastened the newly formed thumb, still attached to the chest, to the freshened stump of the old thumb, the bone being rammed into the head of the metacarpal. The pedicle was finally divided, when he was sure that its blood supply was reestablished, and the thumb was then moulded into its normal shape.

Petroff in a case of tumor of the first metacarpal, resected the entire bone except its head. Into the defect he grafted the first phalanx of the great toe, the distal extremity articulated with the trapezium, the proximal extremity, modeled slightly, was placed in contact with the head of the metacarpal. The result was excellent after three years, the graft becoming in form like that of the metacarpal.

Stubenrauch removed the first phalanx of the left ring-finger for spina ventosa and replaced it by the first phalanx of the second right toe with a corresponding piece of the extensor tendon. The result was excellent.

Goebel resected the last joint of the left small finger of a violinist on account of a deforming inflammation. A free transplantation was made into the defect of the unopened middle joint of the second toe of the left foot. After ten days movements were begun and after nine months the patient was able to appear in a concert. In another case he resected the first phalanx of the ring-finger. He transplanted into this defect the first phalanx of the second toe. He filled up the defect in the toe by a graft taken from the sixth rib. The day after the operation passive movements were begun and on the tenth day active movements were allowed. Some weeks after the operation, motions were as good in the finger as on the healthy side. Radiograms showed both grafts to be perfectly alive.

Sievers resected for sarcoma the entire second phalanx of the left ring-finger, including the two articular surfaces. He transplanted into the defect the first phalanx of the fourth toe, removed entire with its two articular surfaces. He filled in the defect of the toe with a small fragment of the anterior border of the tibia. The result was excellent, and at the end of four months the



Fig. 10.



Fig. 11.

Figs. 10 and 11. Semken's case of a tumor, A, of the third metacarpal bone. Three quarters of the distal portion of the bone were removed and into the defect was transplanted a portion of the tibia, with periosteum.

The picture was taken seven weeks after the transplantation and shows that the graft, B, has lived and has consolidated to the stump of the metacarpal bone.

grafted finger could be flexed to 60° and was most useful.

Primrose showed a patient three years after the removal of an enchondroma of the finger. He inserted an ivory splint in the medulla of the bone to maintain position after the shelling out of the enchondroma. An X-ray showed the remains of the ivory peg, much new growth of bone without thickening, and a complete functional success.

Semken (see Figs. 9 and 10) successfully transplanted into a defect caused by the removal for sarcoma of the third metacarpal bone with its periosteum, a section from the tibia with periosteum.

Frazer removed a metacarpal bone and into the defect he transplanted a section of a rib. Müller makes up the loss of a finger phalanx or a metacarpal bone by a graft taken from the ulna.

Schmieden in 13 cases of spina ventosa of the hands and feet has used bone sections taken from the tibia of the patient to fill up the defect caused by the removal of the diseased bones. Good cosmetic and functional results were obtained in 8 cases. The author lays great weight upon thorough removal of the diseased bone with the avoidance of the epiphysis as much as possible. If fistule be present, the transplantation should

be postponed till they are healed. They should be dressed in extension.

Petrasczewska removed the entire fifth metacarpal bone for sarcoma, and replaced the bone with the fifth metatarsal bone, which was sawed off at its base. The joint end (distal end) was placed into the first phalangeal joint and the sawed end was placed against the os hamatum. Primary union resulted. The function of the newly formed joint was identical with the sound joint on the other hand. The defect in the foot caused no disturbance.

FEMUR

Moskowitz resected the lower extremity of the femur for sarcoma and implanted into the defect a section from the fibula. The lower end of the fibula articulated with the articular surface of the tibia. The resultant expansion of the fibula was remarkable. The result was fine. In a second case he filled in an 18-cm.-long femur defect by the fibula from the same extremity. With the help of an apparatus the patient could walk.

Codivilla in a case of subtrochanteric pseudarthrosis of the femur transplanted a part of the iliac crest pedicled by a flap of the gluteus maximus. Consolidation soon resulted.

Davison reports successfully transplanting a section of the fibula without periosteum into the femur for fracture of its neck.

Katzenstein resected 13 cm. of the shaft of the femur for sarcoma. He filled the defect by a section with periosteum from the opposite tibia, the ends of the graft being inserted in the medullary cavities. The result was perfect after nine months.

According to Murphy the head of the luxated femur, or when separated, even though necrotic provided it still be aseptic, should be replaced and fastened in place by a wire nail or by a bone-peg. As Murphy has shown in one case, full regeneration may take place without ankylosis subsequently. When the femur head has become absorbed, it can be reproduced by excising four-fifths of the trochanter with its ligamentous cover and as much of the external margin of the shaft as is necessary to fill the defect left in the neck of the bone. This fragment should be nailed to the freshened neck with the nail head pointing toward the articulation. Murphy prefers a graft taken from the tibia for transplantation into the femur.

Lewis brings out the point that bone-grafts made to fill cavities remaining after curettage of central giant-celled sarcoma will very frequently die because of the blood-clot which will usually form about the graft, and which will prevent permeation of serum into the bone and also prevent vascularization. He makes the additional point that bone-grafting is usually unnecessary in these cases because the osteogenetic power of the thinned-out cortical bone is great enough to form bone capable of weight-bearing. He cites two cases, illustrating this point, of curettage for sarcoma, one (Case 4) being in the tibia grafted with a section from the same tibia, and the other (Case 5) being in the femur grafted with bone from the tibia. Both formed sinuses and the grafts had to be removed.

D'Arcis resected the upper part of the femur with head and neck for bone-cysts. A transplant was made of a fibula section. The patient walks with a limp after a year. The transplanted fibula has increased to the size of a normal femur.

Delbet in a case of pseudarthrosis of the neck of the femur bored a hole in the neck and in the great trochanter and implanted a fragment of the fibular diaphysis free from periosteum. Perfect consolidation was obtained and radiograms made after the lapse of 10 and 24 months, respectively, showed the transplant still in place and not absorbed. He treated three cases of pseudarthrosis of the femur by fibula grafts.

Stuckey (Case 9), in a case of pseudarthrosis of the femur healed with deformity, used a dowel 7 cm. long with periosteum removed from the right tibia. No consolidation resulted. A second operation was performed consisting in the insertion of a dowel removed from the fibula. Firm consolidation resulted. He also reports (Case 10) a case of pseudarthrosis of the femur. Insertion into intramedullary cavities of a dowel from the fibula without periosteum resulted in complete consolidation.

Lotheissen, in a pseudarthrosis of the femur with great loss of bone tissue, reports the free laying open of the pseudarthrosis by a flap with its base upwards and *outwards*. A bone-flap was fashioned with the base downwards and inwards, the attached femur being split 8 cm. and a corresponding piece, going into the medullary cavity, being separated still attached to the soft parts. By turning 60° the bone-containing flap was inserted into the bone defect and fastened by some periosteal catgut sutures. A plaster splint was applied, and complete consolidation resulted.

Tuffier resected 10 cm. of the right femoral diaphysis for tumor and filled the defect by a graft from the left fibula in such a way that the inferior extremity of the graft penetrated into the supracondylar part of the femur while the superior extremity of the graft was simply approximated to the superior fragment of the femur. After some days it was necessary to make an amputation of the thigh for gangrene of the foot with sepsis. In the amputated extremity the lower femoral fragment was solidly attached to the graft while at the upper extremity the union was so solid that it was impossible to mobilize the graft. All the maneuvers necessary to make the amputation produced no mobility nor dislocation. The grafted surface was covered by normal vascular periosteum and the marrow of the graft bled.

Albee has transplanted the astragalus to make up the loss of the head and neck of the femur. He has also devised a transplantation operation for dislocation of the hip. The great trochanter is sawed off and turned up. The curved superior acetabular bone segment is pried downward and outward with the osteotome to deepen the acetabulum. This leaves a bone gap. The slack in the capsule is reefed by mattress sutures. To fill in the bone gap, a segment of bone having a triangular cross section is removed from the crest of the tibia, long enough when cut into three or more portions to fill in this gutter. The grafts are fixed in position by bone-pegs. The trochanter is returned to its normal position and

sutured with kangaroo tendon through the periosteal structures.

Davison in an article on the "Treatment of Fractures of the Neck of the Femur" concludes:

"1. Autoplastic transplantation of bone is the best treatment for both recent and ununited fractures of the neck of the femur, unless contra-indicated by age or condition.

"2. The fibula furnishes the transplant of choice.

"3. The transplant impinging on the points of compact bone, as described, will graft to these points of leverage and give strong support to the line of fracture.

"4. The transplant imbedded in cancellous bone will stimulate the production of osteoblasts and the growth of new semicompact bone in the cancellous area around the transplant, grafting them together by bony union.

"5. The transplant must be completely immobilized until it has grafted to the recipient bone.

"6. The position of immobilization must be extreme abduction and external rotation of the thigh.

"7. The plaster cast to be effective must extend from the axilla to the toes on the injured side and also include the opposite thigh in abduction."

PATELLA

Bone-grafting for fractures. Vulpius reports a case of fractured patella in which the upper fragment comprised three quarters of the bone while the lower was comminuted. He formed a flap from the upper fragment, comprising periosteum and bone, turned this down and fastened it to the beginning of the ligamentum patella. The result was good.

Rogers has likewise made a successful transplantation of bone in a fractured patella.

Habitual dislocation of the patella. Albee reports a method of applying a bone-wedge in habitual dislocation of the patella as follows: A semilunar incision is made extending to the outer side of the patella sufficiently long to reach below the tibial tubercle and above the external condyle. Without unduly disturbing the underlying joint structures, the external condyle is incised with a broad thin osteotome on its external surface, making a bone incision of from 1.5 to 2 inches in length, and about 0.5 to .75 inch below its anterior articulating surface, and nearly in line with the long axis of the femur. The bone incision allows the anterior surface of the external condyle to be raised to a plane above the internal condyle, by producing a greenstick

fracture near the intercondylar groove, the object being to place a permanent and rigid obstacle in the way of the outward displacement of the patella. When the anterior segment of the external condyle has been pried forward sufficiently to demonstrate its obstructing effect, the width of the bone-gap thus formed is measured with calipers and a section of bone sufficiently large to fill this cuneiform gap is removed from the crest of the tibia through the lower portion of the same skin wound extended below the tubercle. Before the graft is removed, it is drilled obliquely in one or two places so that it may be pinned to the under portion of the external condyle when put into place. Dowel pins, made from an additional portion of the bone removed from the crest of the tibia at the time the graft is obtained, are rounded to fit the drill holes in the graft.

FIBULA INTO TIBIA

Transplantation of fibula into tibia; Hahn's or Huntington's operation. Hahn first did this operation in 1884 and Huntington in 1905. It is suited to patients in whom there has been an extensive loss of tibia but in whom the fibula remains intact. The procedure is as follows:

Through an appropriate incision (curved, across the leg at the level of the upper fragment) the under surface of the upper fragment is exposed and vivified. The fibula is cut off at this level and its end inserted into the under surface of the tibial upper fragment, where it is fixed. Six months later, a second operation is done; the upper surface of the lower fragment of the tibia is exposed and vivified. The fibula is divided at about the same level and its lower end united to the fresh surface of the tibia. In some cases both operations have been done at one sitting. A graft increases in size according to the demands put upon it. The above transplanted fibula increased in size to that of the tibia.

Stone varied the technique somewhat in 1905. He inserted the upper end of the fibula into a mortise cut in the tibia. Six months later, at a second operation, the outer part of the lower end of the tibia and the lower end of the fibula were exposed through the same incision. The fibula was then split longitudinally for four inches. Great care was taken to avoid separating the periosteum from either end of the bone. At the lower end of the split made in the bone, the inner half was cut across transversely at the level of the upper part of the remaining lower epiphysis of the tibia. The inner half of the fibula was then sprung into its new position in the tibia where it was attached. The result was perfect.

Hamilton in a defect in the tibia transplanted both ends of the fibula at one sitting, splitting longitudinally the lower part of the fibula. This latter procedure would seem to be unnecessary. The whole diameter of the diaphysis of the tibia was lost. At first the upper end of the fibula was cut across and inserted into the tibia. Then the lower end of the fibula was exposed, and cut longitudinally for a distance of 3 inches. "Great care was necessary to split the fibula without fracturing the lower piece. The inner half was sprung over to the lower epiphysis of the tibia, a grooved hole having been cut in the epiphysis to receive it." A year later the boy walked unaided.

Most operators now prefer to take the opposite tibia or fibula and transplant it into the defect, since in this instance they have not injured the leg, in case anything goes wrong with the graft taken from the same side. (See Murphy below as to this point.)

Goldman¹ resected 30 cm. of the tibial diaphysis for sarcoma, using a modified Hahn's operation. After dividing the fibula immediately below its head, he placed its pointed upper end into a bore-hole made in the upper epiphysis of the divided tibia. Ten weeks afterwards the patient could bear his full weight upon the limb. Two years after the operation, the fibula was as large as the opposite normal fibula.

Lotheissen reports two cases treated by transplanting a skin-periosteum-ossous permanent flap taken from the same bone. The first was a patient with a pseudarthrosis of the tibia. The bone ends were freshened by means of a flap on one side, while upon the other side was formed a flap containing the bone-graft. Its base was below and on the opposite side to the previous flap, and it contained sufficient bone to cover the defect. It was turned about 60° and filled into the defect where it was sutured with catgut stitches. Consolidation resulted.

Tomita reports a case of loss of substance of the right tibia. From the upper part of the same tibia an osteoperiosteal graft was taken and implanted into the medullary cavities of the fragments.

McKenty reports a case with a defect of six inches in the tibia. The ends of the fragments were freshened. "The fibula was then exposed and sawed through at points opposite to the ends of the stumps and the segment about 3 inches long was moved forcibly over into a sulcus prepared for it by a little blunt dissection. One silver wire suture held each end in apposition to the stump of the tibia." Primary union re-

sulted. Three months after the operation he was able to walk on the leg. A roentgenogram shows that the graft has become completely united to the tibia. Both stumps of the ungrafted fibula have also become united to the reconstructed solid shaft of the tibia. McKenty says there is no need of disturbing its covering of soft tissues, and as the transferred segment carries with it the nutrient artery of the fibula, its vitality is not endangered.

MacAusland reported a case in which the whole diaphysis of the tibia was gone, due to osteomyelitis. There was no regeneration of the defect. The leg was flail-like. On November 11, 1909, a socket was drilled in the remaining head and transplanted from its normal position into the epiphysis of the tibia. On December 31, 1909, a similar operation was done on the lower leg, the shaft of the fibula being transplanted as low as possible into the cup-shaped depression made in the lower tibial epiphysis. A plaster bandage was worn for three months. Nine months later the patient could walk and could jump a rope.

Reubentisch² reports a case of pseudarthrosis of the right leg. A graft was taken from the superior part of the same tibia, and an osteoperiosteal transplant made which was fixed in the loss of substance by periosteal sutures. Good union resulted.

Transplantations of the fibula into the tibia have been done by the following:

- BARTLANDER (1 case). *Chir. Chir.*, 1906, March 31.
 BARRETT. *Arch. d'orthop.*, Milano, 1910, p. 218. (*Abstr.*, *Am. J. Orth. Surg.*, 1911, 998, Feb.)
 CROSTILLA (2 cases). *Cong. ital. chir.*, 1909.
 CURRIAN. *Ann. Surg. Phila.*, 1909, June.
 FRANCESCHI, DE. *Chir. chir.*, 1909, Sept.
 GAROTI. *Policlin.*, 1907.
 HARRIS. *Zentralbl. f. Chir.*, 1904.
 HARRINGTON and SO (2 cases). *Arch. Calif. Chir.*, 1906, 6, 8.
 HUSCHKE, ASH. *Surg. Phila.*, 1904, May, Calif. *St. J. Med.*, 1909, 10, 364.
 MCKENTY. *Pulverized flap with fibula.* *Surg., Gynec. & Obst.*, 1910, 11, 908.
 PERCASSO. *Arch. d'orthop.*, 1906, Jan.
 PORTER. *Deutsche Gesellschaft. f. Chir.*, 1906.
 SCHRAMMER. *Beitr. z. Klin. Chir.*, 1899, 119, 96.
 LINDER. *Deutsche allg. Med. Ztschr.*, 1907.
 STONE. *Ann. Surg. Phila.*, 1907, 349.
 LEONARD (1 case). *Par. Chir.*, 1911, Feb.
 MORTIMER. *Brit. J. Surg.*, 1914, 378.
 BORD (1 case). *Brit. J. Surg.*, 1914, 400.
 MACAUSLAND and WOOD. *Surg., Gynec. & Obst.*, 1912, 16, 340.
 HAMILTON. *J. Am. M. Ass.*, 1913, 2000.
 BRADDER (1 case). *Med. Rec.*, 1911, 1904.
 KAPPEL. *Beitr. z. Klin. Chir.*, 1913, 1000, No. 1.
 RICE. *J. Indiana St. M. Ass.*, 1911, April.
 COOPER. *Am. J. M. Sc.*, 1901, 191.
 GOLDMAN. *Lancet, Lond.*, 1909, Jan. 15, p. 81.

¹Trans. Surg. Ass., Dec. 12, p. 84.

²Münchener f. Chir. Med., 1909, July.

Lambotte reports a case of pseudarthrosis of the left tibia. An osteoperiosteal free flap from the right tibia was fastened to the freshened sides of the fragments by screws. Consolidation was complete below, slight supuration above causing delay but finally complete consolidation resulted.

A successful transplantation was made by Kauert of a section of the fibula, permanently pedicled by the soft parts, into a pseudarthrosis of the tibia.

Wittek reports an osteoplasty for pseudarthrosis of the tibia. After freshening the ends, from the anterior border of the same tibia, a fragment 10 cm. long was fashioned which had a large base below while above it was narrow. The superior extremity of this bone dowel was introduced into a cavity made in the tibial epiphysis and the large inferior end was fixed in the notch in the tibia. Primary union resulted, and consolidation was complete on the thirty-seventh day. Five months later a radiograph showed that the bonepeg was still present. Nine months afterwards there was a single bone mass.

Le Jemtel¹ reports a case of pseudarthrosis of both bones of the leg where he made a dowel without periosteum out of one of the fragments and introduced it into the medullary cavity of each of the fragments above and below so that it was solid. Primary union resulted. Consolidation was slow, requiring almost three months, but it was finally perfect so that the patient walked well.

Leuret reports a complicated case of osteomyelitis in which the entire tibia was destroyed, save the upper and lower extremities. He made a high section of the fibula and transplanted it into the upper extremity of the tibia where he fixed it with a bronze suture. There was no consolidation. He operated a second time, destroying the fibrous callous and fixing the fibula anew; consolidation then resulted. It was not necessary to transplant the lower extremity of the fibula. The patient could walk well with an apparatus.

Brentano resected the lower two fifths of the tibia with its periosteum and the lower joint surface for sarcoma, leaving the tendons uninjured *in situ*. A 15-cm.-long defect remained, into which he transplanted a free bone-graft with its periosteum of corresponding length. This transplant was taken from the upper portion of the tibia of the same side. The graft was wedged into the defect and rested above upon the tibial resected surface, below upon the tarsus, where a small excavation was made. Sutures

above fastened its periosteum to that of the tibia and below to remains of the joint capsule. The ankle-joint in front and behind was drained and the limb put upon a splint. The graft healed *per primum* and after three months consolidation was perfect and the patient could walk with an apparatus.

Stuckey reports a case of pseudarthrosis in the middle third of the tibia of both bones. A 3-cm. defect remained after freshening the ends. From the upper fragment a skin, periosteal, and osseous flap with base below was formed, pushed down and sutured with aluminum-bronze suture. A part of the wound was sutured. A tamponade drain was used and a plaster splint applied. Complete consolidation resulted on the one hundred and fortieth day after the operation. The result was fine.

Bittner resected the entire lower third of the tibial diaphysis leaving the epiphyseal cartilage. All the soft parts were separated from the tibia's outer surface, and the outer half of the tibia was separated with drills, Gigli saw, and chisel, leaving periosteum attached to the inner half. Above, the upper end was at the tuberosity of the tibia. This section was then turned 80° so that the upper broad end came below and was implanted into the epiphyseal cartilage where it was fixed with silk sutures to the periosteum. The original lower part of the segment became now the upper and it was fixed to the lower tibia fragment by a metal suture. The cavity which was left was filled with Mosetig's iodoform plomb. Drainage was inserted behind and below. Consolidation was perfect as was also the result. Röntgenograms showed perfect healing in of the transplanted bone. At first the epiphyseal cartilage did not seem to act, the shortening being 3 cm., but later it took on life and the shortening was only 1.5 cm.

Murphy has the following to say regarding the use of the fibula as a graft into the tibia: "While the fibular transplant from the same leg into the tibia has given a considerable percentage of good results, failure of success is worse than mere failure, as it is disastrous to the limb, and this chance of disaster is entirely unnecessary, as a fragment with its periosteum representing the full length of the tibia from one epiphysis to the other and including the compact bony structure of the tibia can be transplanted from the healthy tibia into the defect of the patient's other tibia without in the least endangering the tibia from which it is removed, and with as great assurance of success as if the fibula were transplanted in the diseased leg." No evil effect has occurred in the tibia

¹ J. de Chir., 1913, Dec., p. 601.

from which the transplant was removed in over 170 cases operated upon by Murphy personally.

Struvsder likewise prefers a section from the tibia for grafts, generally in the body, for out of 30 transplantations the tibia was used 21 times as a graft. Of these 30 transplantations, 16 are reported to have had good results.

Lewis offers a valuable suggestion in the use of a form of direct bone transplantation for the correction of vicious deformities associated with Pott's fracture. In his first case the eversion of the foot caused much pain and disturbance of function and the internal malleolus was much hypertrophied. The internal malleolus was divided at the line of fracture and dissected free. The fibula was resected, allowing overcorrection of the everted foot. A transplant was inserted into the fibula defect of a section of the tibia. The malleolus was then trimmed down to the desired size and nailed to the lower end of the tibia, the articular cartilage being preserved. The final result was good. There was no eversion of the foot. The second case was one in which the foot had evidently been dressed in extension, for the patient walked upon the toes and the foot could not be flexed dorsally, due apparently to outward displacement of the internal malleolus, for this part of the bone seemed to impinge upon the astragalus when dorsal flexion was attempted. The internal malleolus was divided at the point of junction with the shaft, dissected free, removed, and preserved in salt solution. The foot could then be brought to a right-angled position and was inverted, and the malleolus was then nailed in place. At the end of four months the patient walked normally and the function of the ankle-joint was almost normal.

The various combinations of methods which can be used in bone-grafting operations are only limited by the ingenuity of the operator. Dyas' instructive Case 3 illustrates this point. A man received compound, comminuted fractures of both bones of both legs. After two months there was no union but considerable displacement of the fragments. Autogenous bone-grafting was done at one sitting on both legs, but by two different methods and by grafts from two different bones. On one side the fractured ends of the bones were brought out through the incision and transversely freshened. A portion of the fractured fibula of the same side, about 3 inches long, was removed and was placed in the medullary cavity of the two fragments. On the opposite side the fibula was not so readily available, so a section was taken from the crest of the tibia, 3 inches long by a third of an inch in diameter,

and this was inserted into the medullary cavity. Primary union resulted and perfect consolidation took place within the normal time. Dyas also reports two successful autogenous grafts into fractures of the tibia from the other tibia.

Vulpinus states that the treatment of pseudoarthrosis of the tibia has been successful almost without exception, even in apparently hopeless cases, by uniting both fragments by means of a bridgework made of a lamella of bone and periosteum. Technique: A flexible flap of periosteum plus part of the cortical layer of the subjacent bone is cut with a hook-shaped distal extremity, almost parallel to the long axis of the proximal fragment, beginning immediately above the line of fracture. This is done by means of a chisel. Before turning this flap over into the distal fragment, the latter is prepared as follows: Two periosteal lobes are formed; the large one is cut obliquely and folded back laterally; the smaller one is a continuation of the larger one at its lower end, and is folded back distally; into the bone thus denuded of its periosteum a groove is chiseled, corresponding in size and shape to the hook-shaped flap about to be overlapped from the upper fragment of bone; this groove extends to the line of fracture. A similar channel is made in the proximal fragment, extending from the line of fracture to the base of the osteoperiosteal flap described above. The preparation being finished, the osteoperiosteal flap of the upper bone is laid into this channel, bridging over the two fragments of fracture, and is then covered by the peripheral periosteal flaps which are fixed over this newly placed tissue. The limb is then immobilized in plaster of Paris for several weeks. By röntgenograms Vulpinus demonstrates the coalescence of the flap with its new bed and its gradual growth *in situ*.

THE FIBULA AS THE GRAFT OF CHOICE

Gangolphe and Bertein maintain that the fibula should be the bone to select and use as a graft for the following reasons: Its solidity since it can support the weight of the body; the fact that its removal, provided the external malleolus be left *in situ*, causes no disturbance in the straightness of the limb nor in the ability of the limb to carry the body weight; its superficial position which renders the removal of the graft easy; a very great advantage is the possibility of obtaining a bone fragment completely surrounded by periosteum, this membrane being so important to the life of the graft. The side from which one takes the graft, provided the upper extremity is to be grafted, is different. If, how-

ever, it is to be transplanted into the lower extremity, Gangolphe and Bertein, contrary to Hahn and Huntington, remove the fibula on the side opposite to the bone to be grafted. One removes the entire thickness of the fibula. It is useless and most difficult to longitudinally divide the bone, as Viannay does, or to preserve a band of periosteum as Tesserand does.

As for the technique the transplantation is made at the same sitting as the resection. It is best to wedge the pointed extremities of the fibula into the medullary canals of the ends of the resected bone. When this is impossible because of the narrowness of the medullary canals, as in the forearm, the graft should be fixed by buried metal sutures. One should never drain. In 11 instances the graft was transplanted into the upper extremity. In every case, that is in 7, in which there was no recurrence of the tumor, the limb was solid and the function was perfect. In the lower limb of 9 cases, 5 of which were made into the femur, the limb has become solid and useful in 6 instances. In prolonged osteomyelitis with great sequestra it has given a score of successes.

Nové-Jossierand reports a case of congenital absence of the inferior part of the tibia in which he successfully transplanted the fibula.

Barbet says that of 27 cases of pseudarthrosis in which the fibula was transplanted, only 2 were unsuccessful. These were transplanted by Hashimoto and Schlosser.

See page 36 for bibliography of authors who have transplanted the fibula into the tibia.

Lenormant likewise makes a strong plea for the use of the fibula as a transplant.

FOOT

Frattin has used an osteoperiosteal fragment taken from the fibula to fix a paralytic flail-foot by fixing the graft upon the external malleolus and the calcaneus.

In Albee's method for the correction of paralytic club-foot, the graft is placed between the astragalus and the scaphoid; in congenital club-foot, the scaphoid bone is split transversely in halves, and a small piece of bone from the tibia or from the cuboid is inserted between these halves. Albee believes these operations are often permanently correct, and that the awkward flail condition is often overcome and the foot lengthened. He has performed 14 of these operations.

Soule reports a method of applying a bone-wedge in the treatment of club-foot: The joint surfaces having been exposed from above, the articular cartilages on the astragalus and scaphoid

are removed. Next, triangular segments of bone are removed from the head of the astragalus and from the corresponding opposite surface of the scaphoid to admit a wedge-shaped segment of bone secured from the antero-internal surface of the tibia, and after forcing the foot into its corrected position the graft is slid into position from above downward. The forefoot then released fixes the graft securely in position without sutures. Albee has performed 16 wedge-graft corrections of congenital club-foot.

Streissler resected four metatarsals, the cuboid and two cuneiforms. They were replaced by three strips from the tibia.

THE FUTURE OF THE EPIPHYSIS WHEN TRANSPLANTED

What the future of the epiphysis when transplanted will be, cannot as yet be accurately or positively stated. Not enough work has been done upon it as yet to determine whether the epiphysis will survive and functionate if it be transplanted or whether it will die. Jost¹ goes into this unsettled question so far as it can at this time be discussed from the few data at hand.

THE TRANSPLANTATION OF JOINTS

In very rare instances the after-results of joint transplantations have been fair. Friedrich remarks that the number of poor results following joint transplantations has been "frightful (*erschreckend*).²" In the vast majority of cases, the result has been the same as though a typical resection had been performed; i.e., ankylosis. Space forbids a further discussion of this topic.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY

SURGICAL TECHNIQUE

ANÆSTHETICS

Watt, C. H.: Intratracheal Ether Anæsthesia in the Surgery of the Brain and Spinal Cord. *J. Am. M. Ass.*, 1915, lxx, 869.

This article is based on a review of 70 neurologic cases from Johns Hopkins Hospital. In 35 of these the intratracheal method of ether anæsthesia was used and for the remaining 35 the drop ether method was employed.

The importance of having a quiet, uniform anæsthesia in this branch of surgery is dwelt upon. Of the embarrassment incident to obstructed respiration and cyanosis, to coughing and straining during operation, the operator and anæsthetist have been entirely relieved by the use of intratracheal ether anæsthesia.

The distinguishing features of this method, as pointed out by Meltzer, are set forth, together with other advantages brought out by a study of the anæsthesia charts in these 70 cases. These charts were studied with reference to pulse, time consumed, cyanosis, hæmorrhage, time required to regain consciousness, and post-operative complications. With these points in view, comparison of the two methods shows decided advantage in favor of the intratracheal method in most instances. The most striking difference is in the pulse tracings. For the total cases the pulse-rate averages 20 beats, more under drop ether than under the intratracheal ether, and in the cerebellar 52. This is graphically shown by charts.

One striking case is reported in detail. This case had had three operations performed under general anæsthesia—drop ether and chloroform—and each time the operation was abandoned because of the anæsthesia. At a later operation the intratracheal method was used with pronounced success.

In comparing this method with other types of anæsthesia, that is, local and intrapharyngeal, the author believes that the intratracheal method possesses all the advantages of the local without sharing its disadvantages, and that there are no essential differences between the intratracheal and the intrapharyngeal methods.

A few points in connection with the technique are brought out: (1) Complete anæsthetization of the patient before attempting to introduce the tube. (2) Care should be used in introducing the catheter

lest the vocal cords be injured. 3. It is necessary to make certain that the tube is in the trachea and not in the œsophagus before driving in the ether vapor.

The conclusions are:

1. Intratracheal ether anæsthesia has its greatest field of usefulness in operations on the head, neck, and spinal region. The results in cerebellar cases are the most striking.

2. This method is much safer than the drop ether method; the anæsthesia is smoother and more readily controlled. It also offers the most efficient means of artificial respiration.

3. A review of 35 cases of anæsthesia by the drop ether method and 35 by the intratracheal method shows that the pulse is more regular and less rapid under the latter and that hæmorrhage and cyanosis are reduced to a minimum.

Keyser, J. S.: Morphine, Limitations and Uses as an Aid to Anæsthesia. *Delaware St. M. J.*, 1915, v, 1.

The author begins his article with the statement that the use of morphine, morphine and atropine, morphine and scopolamine or hyoscine as an aid to induction of anæsthesia has both indications and contra-indications. However, the contra-indications are so many that his aim is to emphasize them, even in the face of the very general use of these preliminary drugs. The use of morphine, with or without the other drugs, became popular from the theory that they were anæsthetics and synergistic with ether or chloroform. On the contrary, they have action of their own and, though narcotic, hinder rather than help the anæsthesia. Indeed he finds induction is shorter without than with the preliminary drugging.

Urine examination also reveals renal irritation or inflammation, the degree, of course, depending upon the quantity and kind of anæsthetic, duration of administration, and previous health of the patient. Morphine, sufficient to tranquilize the patient, must check the urinary output and hence be objectionable. The action of morphine also upon the pupil and its light reflex is objectionable, and the retarding of the respiration is a decided embarrassment to the patient, diminishing oxygenation just when it is particularly needed. Morphine may be

indicated in muscular male patients to check secretion of mucus, and in women of a neuritic type, also with nitrous oxide and oxygen, this anaesthesia putting no extra tax of secretion upon the kidneys.

FRANK W. PUNCOO.

Weber, F.: Means of Preventing the Injurious Action of Anesthetics on the Central Nervous System. (*Die schädigende Wirkung von Operationen in Narkose und Lokalanästhesie auf das Zentralnervensystem und ihre Beseitigung*). *Med. Klin.*, Berl., 1915, 11, 331.

In previous articles the author has reported experiments that he has been making for years with reference to the central mechanism for the innervation of the blood-vessels. The war has furnished him added facilities for the prosecution of such research.

To test the function of the nerves controlling the blood-vessels he lets the foot hang free and exercises it by dorsal and plantar flexion. In health and when the patient is not exhausted, this gentle exercise induces dilatation of the blood-vessels, except in the brain. When the body is very much exhausted, or when there has been concussion of the brain, this effect is reversed and the blood-vessels contract.

After local anesthesia there is not only this reversed vasomotor action, but the whole vessel tone is changed, the change being manifested

by severe and long-continued dilatation or atony of the vessels. This disturbance lasts for two or three days after local anesthesia. After chloroform anesthesia it is much more pronounced and long-continued. The morbid vascular reaction was sometimes manifest from one to six weeks after operation. These phenomena are explained by the fact that the central vasomotor mechanism is extremely sensitive to injurious influences brought to it by the blood. This mechanism, however, seems to be restored to normal by the stimulating action of alternate hot and cold douches.

Weber reports fifty cases studied from the above point of view. All of them had been examined and found to have normal vasomotor reactions before the anesthetics were given. Tracings from two cases are given. One of the cases showed abnormal vasomotor reactions four weeks after chloroform anesthesia. The alternating hot and cold douches were then applied and soon all the symptoms had disappeared. These symptoms were muscular weakness, exhaustion on climbing stairs, profuse sweating after slight exertion, and headache—all of which resulted from the disturbance of the central mechanism for the innervation of the vessels. The injurious effect of ether seemed to stand about midway between that exerted by chloroform and by local anesthesia.

A. Goss.

SURGERY OF THE HEAD AND NECK

HEAD

Cole, H. P.: Harelip Surgery; Essentials in the Production of Scarless Incisions. *South. M. J.*, 1915, VIII, 700.

Cole believes the following factors tend to prevent scars following operations on labial defects:

1. The use of adhesive strips to obtain relaxation before operation and careful cleansing of the mouth and nose before operation to reduce the amount of infective material.

2. Incisions in the red mucous border should be made at an acute angle to the white skin line, and end in a tent-like projection at the corner of the lip. Thin, sharp instruments are to be used.

3. The tissues are relaxed by freeing them well out onto the cheek; this is done with blunt dissectors and curved scissors. Lead plates and silver wire are used to hold the septum over, after it is freed.

4. Horse-hair is the preferred suture material, and the skin sutures are removed at the end of twenty-four hours, the latter point being emphasized.

Guleke: Treatment and Prognosis of Gunshot Injuries of the Skull (*Über Therapie und Prognose der Schädelfraktionen*). *München. med. Wochenschr.*, 1915, LIII, 942.

Guleke has treated a large number of gunshot injuries of the skull. Of 10 cases in which the shots

passed entirely through the skull, 2 died; they were not operated on, on account of coma in one case and meningitis in the other. In such injuries great care must be taken to see that the wound canal does not become infected secondarily. This takes place particularly easily in wounds where brain substance comes out of the opening in the bone and collects under the soft parts. In such cases Guleke cuts away the soft parts until he comes to healthy bone; he then removes the brain substance and sponges the wound dry. After that, the wound quickly becomes covered over with clean granulations, and heals.

There were 26 cases in which the bullet had lodged in the brain. Of these 3 died: 1 that could not be operated on because of meningitis, and 2 died six weeks after operation from brain atrophy. He operates and removes bone fragments and the projectile if it can be localized by roöntgen rays and is easily accessible. A search for the projectile should not be made through an entrance wound that is infected or may easily become so. If there is already infection and retention the skull should be freely opened; if there are epileptiform attacks from rapidly increasing brain edema or irritation of the meninges, operation should be immediately performed.

Among 105 patients with tangential injuries, 51 had open injuries of the brain, and 55 of these died: 27 from meningitis, 5 from progressive enceph-

itis and 3 died from the severity of the brain injury.

The fact that the dura is intact does not guarantee that there will not be a septic process in brain injuries lying underneath it. One case died six weeks after a primary operation on the bone from brain abscess. In 66 of the cases of tangential shots the bone was not injured, but in all cases where it was, Gulleke operated immediately; and even in cases where apparently only the soft parts are injured, he makes a röntgen examination, for it sometimes reveals fracture of the internal table. In the treatment of these wounds, if the defect in the bone is not too great, the author does no suturing but simply drains with a rubber tube and loosely tampons the wound. He has found that brain abscess appears four times as frequently in the cases that are not operated upon as in those that are operated upon promptly; but at least 15 per cent of the cases of tangential wounds die later of brain abscess, even when they are operated upon. Other complications are also apt to appear later, as cortical epilepsy, color blindness and other disturbance of vision, so that the case cannot be regarded as closed for years. Openings in the skull should be closed after about six months by plastic operations.

A. Goss.

Löfberg, O.: Covering Defects in the Skull (*Zur Deckung von Kranialdefekten*). *Militärarzt*, 1915, xlix, 274.

Löfberg describes four cases in which gaps remained in the skull after trauma. In one case a piece of the internal table that had been broken off was inserted into the gap. Two were covered over simply with flaps of skin and periosteum, while the fourth was covered with a piece of bone removed from the patient's tibia. Recovery was uneventful.

For a long time there was considerable discussion as to whether such defects should be covered over at all, but surgeons are now generally agreed that they should be, for the sake of freeing the patient from the dangers to which he is subjected by having his brain exposed, and because the bone of the skull shows little tendency to regeneration. Various materials have been suggested for the purpose. Various kinds of metal plates have been used, as well as cooked bone from other animals, and the horns of cows, which have been used very successfully in Lexer's clinic. Löfberg believes that it is preferable to use bone from the patient himself, because the transplant takes better and does not behave as a foreign body, as other substances frequently do. A layer of bone may be taken from the external table and inserted into the gap, or quite large pieces of bone can be obtained from the tibia for the purpose. He does not think it advisable to use bone from the scapula.

Kleinschmidt proposes taking the bone from the median surface of the tibia and leaving the periosteum twice as long as the bone, so that it may be folded over, and the bone thus be covered on both sides with periosteum.

A. Goss.

Marburg, O. and Ranzi, E.: Late Abscess After Gunshot Injury of the Brain (*Über Spätabzesse nach Schussverletzung wegen des Gehirns*). *Neurol. Zentralbl.*, 1913, xxxiv, 346.

The authors have operated upon 62 cases of gunshot injury of the brain during the past year, with 23 deaths. Among these 62 cases abscess was found at operation in 42. But there were a number of patients who apparently recovered perfectly from the operation, but who later developed abscesses and died. Six such cases are described. The abscesses generally developed four or five months after the operation; in one case the interval was eight months.

The symptomatology of late abscess is quite characteristic. The patient shows a rise of temperature for awhile, and then suddenly general symptoms develop, such as headache, vomiting, and signs of beginning meningitis. There is apt to be an increase in already existing local symptoms, such as hemiplegia or aphasia. These phenomena are explained by the fact that the abscess has been strictly encapsulated for some time, but finally there has been propagation of the pus to the meninges through a small opening into one of the ventricles. Often when the abscess becomes manifest it is too late to save the patient by operation, but cases can often be saved by early operation. An illustrative case is described.

From the foregoing it is evident that all cases of brain or skull wounds should be kept under careful observation for several months, and if there is a rise of temperature or the slightest sign of cerebral irritation the wound should be opened up. If there is pus, free incision and drainage are indicated.

A. Goss.

Mayer, O.: Plastic Covering of Defects of the Dura After the Excision of Brain Prolapse (*Über die plastische Deckung von Duradeckten nach Abtragung von Hirnprolapsen in der Otischirurgie*). *Ztschr. f. Ohrenh. u. f. d. Krankh. d. Luftwege*, 1913, lxxiii, 37.

Mayer advises a more active treatment than do most surgeons for persistent prolapse of the brain. He does not think it necessary to wait until the prolapse has healed over to be sure of asepsis, but advises operation in every case because of the dangers to which patients with persistent prolapse are exposed. After removing the prolapse, the defect, not only in the bone, but in the dura, should be closed by a plastic operation. He has done this successfully in one case by using a flap of periosteum. The flap of periosteum quickly becomes adherent to the dura and puts a stop to the discharge of cerebrospinal fluid, thus reducing to a minimum the danger of secondary infection of the meninges. There need be no fear that a rise of intracranial pressure will sever the union between the periosteum and dura. This plastic closure of the dura also prevents the formation of a scar adherent to the skin and extending into the brain. The advantages

of this plastic operation are so great that the author advises it even in cases where the prolapse has receded spontaneously, for there may be a scar of the dura mater that will become adherent to the brain and produce serious disturbances. A. Goss.

NECK

Eastman, J. R.: Permanent Partial Compression of Both Common Carotids in Epilepsy. *Am. J. M. Sc.*, 1915, 41, 304.

The author bases his experiments on the theory that the amount of blood in the brain has some relation to the epileptic attacks. Von Reimer, Cawling, and Munnburg, prior to this had good success in controlling the convulsions by digital compression of both carotids. The latter sought to make the relief permanent by twisting a one milli-

meter silver wire around each common carotid until the temporal pulse was barely perceptible and after two months he reports distinct improvement in his two cases. The same technique was used by the author in 6 additional patients. While but a few weeks have elapsed in some cases, all show more or less improvement except one which developed coma immediately and necessitated the removal of the silver wires.

Eastman concludes that future experimentation is not without danger and is only justifiable in general idiopathic epilepsy in youthful persons or in traumatic or focal epilepsy which has resisted cranial decompression or other appropriate treatment; also that the sudden influx of blood into the brain is not the real cause of epilepsy but may determine the frequency and severity of the attacks.

HENRY J. VAN DER BEEK.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Willis, B. C.: A Plea for the Reduction of the Death Rate from Cancer of the Breast. *Old Dominion J.*, 1915, vol. 103.

When women are sure that there will be no guessing as to the nature of the growth and no mutilating operation undertaken not commensurate with the gravity of the disease, they will come early for treatment. They dread the lump in their breasts but still more the mutilating operation without a positive diagnosis of cancer. Consent to the removal of a small tumor, not of the breast, can usually be obtained readily before symptoms are manifest. If a positive clinical diagnosis can be made from subjective and objective symptoms, the favorable operative cure of about 75 per cent will be reversed.

It has been the author's practice in small tumor cases to remove them under local anæsthetic, make a positive diagnosis, and proceed accordingly. Until a cure for cancer is found, physicians must depend for any increase in permanently cured cases on early surgical interference, for the utmost limits of radical operations upon the breasts and glands involved have been reached. The consensus of opinion is that cancer is on the increase, which is undoubtedly true. This increase may be accounted by two factors. First, more women reach the cancer age; second, lack of exercise of the breast functions.

EDWARD L. CORRELL.

Dayton, H.: Diagnosis of Intrathoracic Neoplasms by Exploratory Puncture. *Surg., Gynec. & Obst.*, 1915, 20, 304.

Dayton reports a case demonstrating the diagnostic value of examination of the tiny fragment of tissue obtained by exploratory puncture with an aspirating needle of moderate size in cases of intrathoracic lesions of doubtful character.

The history was that of a case of serofibrinous pleurisy, but the convex upper level of the radiographic shadow in the chest and semitransparent areas within it; blood-tinged pleural fluid; the displacement of the heart toward the left; the presence of a tympanitic area between the area of cardiac dullness and one of dullness in the right chest anteriorly, with a friction rub over the area of dullness; persistent eosinophilia in the absence of intestinal parasites or other obvious causes, and irregularity of the areas of nasal voice—all suggested the existence of a neoplasm rather than a serofibrinous pleurisy. A needle inserted into the right chest in the ninth space near the angle of the scapula in order to obtain a fragment of tissue for examination, yielded blood-tinged serous fluid in which were two small fragments which resembled thick mucus enclosing shreds of tissue about 2 mm. in diameter and 1.5 mm. in length. These showed a typical angiosarcoma.

Encouraged by his success in diagnosing this case, the author has attempted the same unsuccessfully in two others. He says that examination of fragments of tissue obtained by exploratory puncture, employing a needle with a lumen of about 1 mm., is of diagnostic value only when the results are positive; but in these instances it may be of real assistance in differentiating from syphilis, tuberculosis, and delayed resolution of pneumonia.

TRACHEA AND LUNGS

Chiari, O.: Circular Resection and Suture of the Trachea and Plastic Reconstruction of Large Defects in the Trachea (Über die circulaire Resektion und Naht der Trachea und die plastische Rekonstruktion grosser Defekte der Trachea). *Monatsh. f. Ohrenh.*, 1915, 101, 337.

Circular resection and suture of the trachea has been practiced since about 1880, but Kuster in 1885

was the first to report a plastic operation to repair a defect that was so large that the two ends of the trachea could not be brought together. Chiari gives the histories of 16 similar cases since reported.

The trachea may be resected for trauma, stenosis from diphtheria, or for new-growths. Care must be taken in making the resection to spare the recurrent laryngeal nerves. When it is a question of merely suturing the ends of the trachea together, the head is bent forward and the posterior part of the trachea sutured with catgut from inside, and then the anterior wall sutured from outside with silk. The soft parts are then sutured in several layers and a small drainage opening left. If it is necessary to do a plastic operation, Chiari prefers Gluck's technique. He takes a quadrangular flap of skin from the right side and sutures it in position to form the posterior wall of the trachea. This is then left to heal, and at a second operation a flap from the left side, still attached by its base to the neck, is sutured in position to form the anterior wall, with the epidermis inside. Then another flap of skin from the sternum, including a thin layer of bone, is placed over this, so that the anterior wall is reinforced with bone.

In a case of the author's it was only necessary to resect half of the wall of the trachea, so that the lumen was easily restored by means of a skin-flap. He advises leaving a part of the wall of the trachea if possible, because if the whole wall is removed, the traction of the weight of the lungs may be sufficient to obliterate the lumen and bring about a recurrence of the stenosis. But if it is necessary to resect the whole circumference of the wall, Gluck's two-stage plastic operation is very much preferable to simple circular suture.

A. Goss.

Friedberg, S. A.: Foreign Bodies in the Respiratory Tract. *Illinois M. J.*, 1915, XXVIII, 175.

The author gives his personal experience of some of the phases of the symptomatology, diagnosis, and treatment of this condition. The difficulty at times in obtaining a satisfactory or definite history of an accident is discussed. The presence of a foreign body in the œsophagus may produce respiratory distress thus simulating the symptoms of a foreign body in the air passages. A case in point is detailed. Signs and symptoms produced by the lodgment of a foreign body in the larynx, trachea, and various parts of the bronchial tree are given with illustrative cases. Emphasis is laid on the localization of physical findings in certain parts of the lungs.

Among these are localized bronchitis, pneumonia, bronchiectasis, or abscess. Röntgenoscopic examination with its value and limitations is considered, and changes produced in the lung by the long continued presence of a foreign body are described.

The progress of the patient after removal and the necessity for further observation and treatment is strongly emphasized. Bronchoscopic treatment with caution as to technique, anesthesia, the indications for upper or lower bronchoscopy, complications and difficulties and röntgenoscopic bronchoscopy are briefly discussed. Anesthesia, other than local in adults, is not recommended. Children are easily handled without any anesthesia.

Upper bronchoscopy should be done wherever possible unless a tracheotomy, as an immediate life saving procedure, is necessary. Infancy is no bar, as was formerly taught by the Killian school, to upper bronchoscopy. The author's youngest patient in which a foreign body was removed by the upper route was three months of age.

Marion, G.: Extraction of Projectiles from the Lungs (*De l'extraction des projectiles intrapulmonaires*). *Presse méd.*, 1915, XXII, 353.

Marion thinks that foreign bodies should be removed from the lungs in all cases. It is a simple and harmless procedure and not attended by the danger which most surgeons have been inclined to attribute to it. A projectile in the lung is a source of constant irritation and exposes the patient to attacks of pneumonia, and it also prevents them from returning to military service. He has seen patients who did not complain of any objective symptoms, but only of interference with respiration, and when he removed the projectile he found it surrounded by an encysted abscess.

He localizes the projectile with a localizing compass and makes an incision over it. If it is under a rib, 4 or 5 cm. of the rib is resected. The lung is then fixed to the thoracic wall with three or four catgut sutures, so that the field of operation is held firmly. In only one case did he fail to find the bullet and that was one in which he failed to fix the lung to the thoracic wall in this way. The lung is then incised and the bullet removed with the finger. It is much easier to detect a bullet in lung tissue than in muscle. A tampon wet with strong carbolic acid is placed in the wound and the usual dressing over it. He describes 27 cases in which he has removed projectiles in this way and recovery was rapid and uneventful in all cases.

A. Goss.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Quénu, E.: Injuries of the Abdomen (*Plaies de l'abdomen*). *Bull. et Mém. Soc. de chir. de Par.*, 1915, xli, 1815.

Quénu presented to the surgical society the abdominal cases of Petit, Charrier, Bichat, Pascalis,

Pellot, Bouvier, and Caudrelier. His report includes 153 cases, 110 of which were operated upon, 101 of them being primary laparotomies.

In the first part of the work he gives reports of the individual cases of these different surgeons, followed by a table, giving the nature of the wound

in all the cases, the operation, and results. In the second part he discusses in a general way the treatment of injuries of the abdomen in war.

Eliminating the non-penetrating wounds from the 223 cases mentioned above, there remain 96 penetrating injuries of the abdomen treated by primary laparotomy with 33 deaths, or 34 per cent. In a series of cases previously reported by him and given conservative treatment there was a mortality of 61 per cent, but even this he thinks was too low, for a considerable number of the cases reported from the field as penetrating wounds are found on closer examination to be non-penetrating.

The author thinks that operation should be performed in all cases that are clearly penetrating, and if there is doubt an exploratory operation is justified. Needless to say, operation should be performed as soon as possible; but if the hospital is placed too close to the firing line it is not only in constant danger, but it cannot be as well equipped as one farther away. The best arrangement seems to be a hospital 15 or 20 kilometers from the firing line with a well-equipped automobile ambulance service from the front.

As to the technique, skill and thorough sterilization are of course prerequisites. The anesthetic used in most of the cases reported was chloroform. Spinal anesthesia has been found unsatisfactory. The incision was generally either through the entrance and exit wounds, or a median incision above or below the umbilicus, as indicated. In injuries of the small intestine, suture or resection and suture was generally practiced. Perforations in the large intestine were sutured, but circular suture of the large intestine is much more dangerous and less effective than that of the small intestine. Injuries of the liver were generally tamponed, but if small were occasionally sutured. Injuries of the spleen were generally treated by splenectomy. Some of the wounds were drained and some were not, but Quéau is inclined to favor systematic drainage through the pelvis. The question of the best time for evacuation of cases of abdominal injury is not yet settled. A. Goss.

Jung, E.: Lavage of the Peritoneum with Ether
(Il lavaggio del peritoneo con l'etere Solonico).
Chir. (Chir.), 1913, VIII, No. 4.

To test the ether treatment of acute peritonitis recommended by Morestin, the author carried out a series of animal experiments in which he irrigated normal and inflamed peritoneums with ether. He draws a distinction between the immediate and late effects. The immediate consequences are local and general in nature. Locally the rapid evaporation of the ether produces a temporary constriction of the mesenteric vessels, which later dilate, causing a rapid and quite marked fall in temperature in the abdominal cavity, which produces a certain degree of shock. The loops of intestine reddened and show spasm of the muscles.

The general symptoms are caused by rapid

absorption of the ether, which in itself may cause death. The absorptive capacity of the inflamed peritoneum is decreased, so that the general symptoms are not so intense in purulent peritonitis, but absorption is favored by the pressure under which the ether vapor is placed in the abdominal cavity. The bactericidal effect of the ether does not take place because of its rapid evaporation. The late effects are serous-hemorrhagic inflammation of the peritoneum followed by adhesions. There were changes in the kidneys only in exceptional cases. The experiments did not show any therapeutic effect in peritonitis in dogs; in rabbits death was undoubtedly hastened. In septic peritonitis in dogs death seemed to have been delayed somewhat. The author concludes that Morestin's method is entirely too dangerous to be put into practice. A. Goss.

GASTRO-INTESTINAL TRACT

Nyström, G.: Drainage of the Stomach by Gastrostomy (Über Magenabdrainage durch Gastrostomie). *Zentralbl. f. Chir.*, 1913, VII, 711.

Jacoboulay first proposed draining the stomach by gastrostomy in cases of ileus. He published a case in 1905. Lennander in the same year reported his use of gastrostomy for the purpose of drainage in volvulus of the small intestine. He extended the indications for the operation considerably, but his recommendations have not been generally adopted.

Nyström recommends the procedure in the following conditions:

1. In ileus. Drainage of the stomach empties out the intestinal contents from the stomach, avoids distension, allows free movement of the diaphragm and prevents interference with heart action and respiration.

2. In operations on the stomach where there is any danger of the sutures not holding, especially after operations for perforating ulcer of the stomach or duodenum. It serves the double purpose of removing toxic intestinal contents from the stomach and preventing distention and pressure on the sutures from within. The patient is relieved of vomiting, pain, and restlessness. The stomach fistula also allows of examination of the stomach contents at different phases of digestion, and of regulation of the diet based on the findings.

The author describes the very simple technique of performing the gastrostomy by means of a cannula containing a catheter. The walls of the abdomen and stomach are punctured with the cannula and it is withdrawn, leaving the catheter in place, where it is fastened with a purse-string suture and left for about a week. A. Goss.

Torrance, G.: Rovsing's Operation for Gastro-coloptosis, with a Report of Seventeen Cases Successfully Operated Upon. *Tr. Am. Ass. Obst. & Gynec.*, Pittsburgh, 1913, Sept.

The 17 cases cited have been operated upon within the past two years. The symptoms which were

the most prominent were constipation, epigastric pain (usually left-sided), nausea, and vomiting; a toxic condition evidenced by headaches, nervousness, cachexia, loss of weight and marked mental depression in some.

All but 2 cases were fluoroscoped and X-rayed. Six cases had been previously operated upon without any relief of the symptoms; in 3 the appendix had been removed; in 1 case pus-tubes had been removed; and in 1 case the left kidney had been removed for severe left-sided pain.

With this method the appendix is removed and all other intra-abdominal conditions that need it are attended to, as uterine retroversion, cystic ovaries, etc. In one case the gall-bladder was drained.

Rovsing's operation has been modified somewhat, and an operation has been devised for the elevation of the liver by thrusting a curved forceps through the posterior fascia just at the tip of the ensiform cartilage; the suspensory ligament is caught and pulled back through this opening and drawn down tight enough to bring the liver up snugly against the diaphragm, the ligament being then sutured to the fascia.

The usual three rows of sutures are passed on the anterior surface of the stomach and the colon is sutured to the lower part of the anterior surface of the stomach by strong interrupted linen sutures, using the lower band of the colon, and by holding the omentum up and using a straight needle, the sutures are passed through the omentum near the attachment to the stomach; by this method the omentum is not puckered up as in Rovsing's operation and not attached to the abdominal wall as in Coffee's operation, but remains intact and as free as before operation. The colon is elevated considerably more than by the other methods and leaves no cavities in which the small gut may become strangulated.

The first case, a female, 19 years of age, had been troubled with constipation, loss of weight, toxæmia, and fever. Appendectomy was performed two years ago, Rovsing's operation being used, and the cæcum pleated over. The patient has gained 30 pounds, her color is normal, and the constipation and all toxic symptoms are cured.

The second case, a male 30 years of age, had marked constipation, and had been given croton oil in order to get a movement. He was very toxic; was bed-ridden, and his temperature would run up to 105° F. at times. Appendectomy was performed. He gained 30 pounds in four months; he has been relieved of all toxic symptoms and is back at his regular work.

The third case, a male aged 34, a city detective, was so troubled with constipation, left-sided pain, and severe headaches, that he was practically obliged to give up his work. He was relieved of the constipation, headaches, and all other symptoms, and 16 months after operation is hard at work chasing train wreckers. A skiagram recently made

with bismuth meal and enema shows the stomach and colon in normal position.

The second case, a female aged 33, had not been well since puberty, was constipated and toxic; was troubled with backache, digestive disturbance, and nervousness. Rovsing's operation was done 18 months ago. She is completely relieved of the constipation and nervousness and says she is perfectly well.

The fifth case, a female 50 years of age, had not been well for ten years; was troubled with nausea and vomiting; constipation not marked. Rovsing's operation was done 15 months ago, and the gall-bladder was drained at the same time. The wound became infected by her pulling off the dressings, but results were not interfered with. All symptoms were relieved and she was in good condition when last heard from, two months after operation.

The sixth case was a married woman 40 years of age, with very relaxed abdominal walls. She had been in bad health for 4 or 5 years; was troubled with constipation, nausea, and vomiting; had vague abdominal pains, more marked on the right side; was considerably emaciated, very nervous and hysterical. Appendectomy was done a year ago, and her condition became worse. Rovsing's operation was done; there was marked ptosis of the liver, stomach, and colon. The suspensory ligament of the liver was shortened 2.5 inches, and the upper surface of the liver scarified to encourage adhesions to the diaphragm. Skiagrams made several months later show the stomach and colon in their normal positions.

The seventh case, a school girl 18 years of age, had not been well since entering high school, three and a half years ago. She was troubled in the right side, backache, headaches, constipation, nausea, cardialgia, and had lost 15 or 20 pounds in the past year. She had a muddy color (toxic); there were mitral systolic murmurs. Skiagraphy showed marked ptosis of the stomach and colon. After Rovsing's operation was performed, she made a rapid recovery, and gained 20 pounds in six months. The constipation was completely relieved; her color was clear and fresh, and all nervous symptoms have disappeared.

The eighth case, a female aged 36, was the mother of one child 16 years old. Her trouble began ten years ago, with indigestion and smothering spells. She was very nervous and constipated (bowels never moved without purgatives). Her color was bad, and she was very toxic. She lost 30 pounds in six months. She had her appendix removed two years ago, and her condition has been much worse during the past year. She was affected mentally. She had a pain in the left side along the œsophagus. She was a small slender woman (virginal type). A skiagram showed marked ptosis of the stomach and colon. Rovsing's operation was done under gas-oxygen anaesthesia. A high rectus incision was made showing adhesions of the omentum to the appendix scar. The liver was very low, and the

author's "round ligament" operation was done to shorten the suspensory ligament; the cecum was infolded. She made a rapid recovery; showed marked improvement within two weeks and was eating full diet. The constipation was cured; her color became normal; and all nervous symptoms were relieved. She has gained 40 pounds in five months and says she is perfectly well.

The ninth was a case of miscarriage two years previous, followed by infection. An operation was performed eight months ago, and the pus tubes and appendix removed. She was much worse after this operation; was very constipated, constant belching, very nervous, pain in epigastrium and back, nausea. A skiagram showed the stomach much dilated and ptozed to within an inch of the pubis. A third of the meal was in the stomach after six hours. Rovsing's operation was done. Liver very low; author's "round ligament" operation was done to elevate the liver. Cecum infolded. The wound became infected but healed by granulation without hernia. She is well and strong five months after operation; is completely relieved of the constipation and other stomach symptoms and has gained weight. This patient is a full-blooded negro and is the only case the author has seen in this race.

The tenth case, a female, 25 years of age, was troubled with nausea and vomiting almost daily for five years; was very constipated; very nervous and hysterical; color good and fairly well nourished. She had been much worse for the past few months, had been kept in bed for two weeks but continued to vomit. A test meal showed absence of HCL. Her appendix had been removed several years ago. Rovsing's operation was done under gas-oxygen anesthesia. The stomach was not markedly ptozed. The colon, which was very long and very low, was sutured to the stomach, and the stomach was fixed in the usual way to support the colon. The sigmoid was very long and large (not removed). The Eaddy-Webster operation was performed, since which time all nervous symptoms have disappeared; the nausea and vomiting have been relieved and she is back at work keeping books four months after operation and seems strong and well but has some slight constipation from the elongated sigmoid.

The eleventh case, a female aged 21, had been troubled with nausea and vomiting since menstruation began at 14 years of age. She vomited her evening meal almost daily; was troubled with cardialgia, eructation, and had a bad color. A skiagram showed the colon and stomach below the brim of the pelvis. Rovsing's operation was done, with appendectomy. Four months after operation all symptoms of constipation and vomiting were relieved. Her complexion is clear and ruddy; she eats anything she wishes, and is gaining in strength and weight.

The twelfth case, a female aged 36, had one child eight years old. There was no abdominal relaxation. She was very constipated; has always had head-

aches, was extremely nervous, worse since birth of the child. Pain was worse over the caecal region. Fluoroscopic examination showed the stomach well below the brim of the pelvis, the cecum dilated and colon very low. Under gas-oxygen anesthesia Rovsing's operation was done, with removal of the appendix, and the cecum was plicated over. She made a rapid recovery. The headaches and constipation were completely relieved five months after operation. She has gained 25 pounds, is practically free from nervous symptoms, and says she feels as well as she did when a girl.

The thirteenth case, a female aged 60, was practically bed ridden for ten years; constipation was marked, and she had left-sided abdominal pain. Her left kidney was removed three years ago for this condition. She was much worse after the operation. The abdomen was extremely tender. A skiagram showed the stomach and colon filling the pelvis. Rovsing's operation and the author's "round ligament" operation were done to elevate the liver. The left lobe of the liver was very low and was sutured to the diaphragm by through-and-through sutures of chromic catgut. The constipation is completely relieved, her color is good and she has gained 20 pounds or more and is very much improved five months after operation.

The fourteenth case, a female aged 30 years, had as chief symptoms, pain, nausea, vomiting, and constipation. Rovsing's operation was done; the stomach and colon were both very low. She has gained considerable flesh since the operation and is relieved of the constipation, but only a few months have elapsed since the operation and much more marked improvement is looked for.

The fifteenth case, a female aged 32 years, was troubled with marked constipation, pain in the left side, nausea and vomiting, loss of weight, marked nervousness, and cachexia. She was four months pregnant. Skiagrams showed a marked ptosis of the stomach and colon. Rovsing's operation with the author's "round ligament" operation for the elevation of the liver was done, with the removal of the appendix. Four months after operation she has gained 40 pounds; is completely relieved of the constipation and all nervous symptoms, with no disturbance of the pregnancy.

The eighteenth case, a female aged 30 years, had suffered with constipation, sick headaches, nausea and vomiting for a number of years. Rovsing's operation and appendectomy were performed and the cecum plicated over. Two months and a half after operation she has been relieved of the constipation, headaches, nausea and vomiting and is taking on some flesh and is rapidly regaining her normal condition.

The last case, a female aged 45 years, had symptoms beginning two and a half years ago with indigestion, severe left-sided pain, marked constipation, and some emaciation. X ray plates showed a ptozed condition of the stomach with a suggestion of an hour-glass condition. Rovsing's operation

with some repair of a pelvic condition was done. She is relieved of the constipation and the other symptoms are improving, but the operation is of too recent date to show the full benefit to be derived from it.

Truesdale, P. E.: Pylorus: a Study of Its Musculature. *Surg., Gynec. & Obst.*, 1915, xvi, 295.

Hypertrophy of the pyloric sphincter muscle and of the musculature of the pyloric antrum commonly exists in the presence of ulcer of the stomach or duodenum. The cause of this overgrowth of muscle is continued spasm. The degree of hypertrophy will necessarily be in proportion to the continued excess of function. It is further indicated that other lesions of the gastro-intestinal tract, such as cholelithiasis and appendicitis, may produce a considerable degree of hypertrophy of the circular muscle-bundle of the pylorus from pyloric spasm. Examinations at the operating table appear to confirm this view. The overgrowth of this pyloric muscle when marked is a definite obstruction to the normal evacuation of the stomach. Occasionally the muscle tumor is the chief cause of obstruction. The author believes that the cicatrix of an ulcer, especially in the duodenum, is rarely extensive enough to obstruct the pylorus.

Atrophy of the pyloric sphincter muscle follows gastrojejunostomy. When the stoma serves for the passage of all the stomach contents the pylorus ceases to functionate. Its musculature atrophies; control of the pylorus is lost; and the contents of the duodenum flow back into the stomach. This observation was made at a secondary operation upon a patient who had had a gastrojejunostomy done six years before.

The author refers to the possibility of a partial congenital stenosis being permanent. In this way he would explain an occasional case of indigestion dating back to childhood with no demonstrable lesion at the time of operation, except the presence of a perceptible thickening at the pylorus.

Strauss, A.: Clinical Aspect of Diseases of the Extrapertoneal Appendix Vermiformis. *Surg., Gynec. & Obst.*, 1915, xvi, 318.

The extraperitoneal appendix though not common is not uncommon. Its occurrence has been explained in the left half of the abdomen, and its journey to the right iliac fossa. Thus there is chance of its being arrested in transit and of the peritoneum being anomalously developed.

The appendix has been found wholly or partially extraperitoneal in from 0.6 to 6 per cent of cases in different series of cadavers examined (excluding 2 cases in a series of 25 subjects). Literature shows still fewer cases met with at operation.

The cases reported fall under three heads: (1) those presenting a straightforward picture of acute appendicitis; (2) those simulating a perinephritic abscess; and (3) persistent fecal fistula.

Cases included under the first heading emphasize

how careful the operator must be not to miss an extraperitoneal appendix which can be seen only after the peritoneum is incised and the cæcum raised.

The second group includes a case in which the abscess pointed in the lumbar region and contained actinomycetes, and later developed a subhepatic abscess. This was the only fatal case.

A second case illustrates the significance of fetid pus and subsequent fecal fistula from a lumbar abscess, and shows that these are signs which point to the appendix as the etiological factor.

Another case developed fecal fistula after an operation in which the appendix was not found and was considered to have sloughed, but which was removed from its extraperitoneal position at a subsequent operation.

Meyer, L. B.: Primary Carcinoma of the Appendix. *Surg., Gynec. & Obst.*, 1915, xvi, 354.

Meyer reports 3 cases occurring in 707 consecutive appendectomies, reviewing 266 cases reported in the literature. The first case was reported by Merklin in 1838. In 1903 Moschowitz was able to collect only 18 cases. Since then reports have been more frequent, because appendices are more frequently examined microscopically. This examination is absolutely necessary, for in only 10 per cent of the cases can the pathologist even suspect the condition by macroscopic examination of the specimen.

About one-half per cent of all removed appendices are carcinomatous (an additional argument for removing even apparently normal appendices during all laparotomies if possible without danger to the patient). The condition is most frequent in the third decade of life; next in the second and fourth. It is never recognized before operation, which is usually performed for an acute or chronic appendicitis. In fact, carcinoma of the appendix practically always exists at the site of a stricture, due to a preceding inflammation of the appendix. The condition is relatively benign, though a number of cases with metastases and death have been reported.

There is considerable controversy as to the exact pathology of the condition. Milner does not consider the condition a true carcinoma, but an inflammatory proliferation of the lymphatic vessel endothelium, and has applied to it the term "pseudo-carcinoma" or "carcinoide." Aschoff calls it *Schleimhaut Nevi*. It is usually benign, but may become malignant in the same way as nevi in other parts of the body. Microscopically, two main types are to be distinguished, a small round-celled carcinoma, carcinoma simplex or scirrhous, and a cylindrical-celled type, resembling the ordinary type of intestinal cancer.

The author urges careful study and report of all cases, so as to clear up doubtful pathology and show how to diagnose cases before operation. He also suggests the possibility of some of the apparently pri-

many carcinomata of a non-epithelial organ, like the peritoneum, being secondary to unrecognized appendix carcinoma.

LIVER, PANCREAS, AND SPLEEN

Walton, A. J.: *Reconstruction of the Common Bile-Duct*. *Surg., Gynec. & Obst.*, 1912, xvi, 382.

The author considers the operative technique to be undertaken in cases of obstruction of the common bile-duct. In many cases a cholecystenterostomy can be easily performed. However, if the gall-bladder is absent or atrophied the operation cannot be performed.

Such cases fall into two groups: (1) In one the duct is dilated and therefore can be united to the intestine. (2) In the other group, owing to the presence of a stricture, the duct is collapsed. It is in such cases that the greatest difficulty will arise at operation.

The various operations which have been previously undertaken are reviewed, and it is shown that although each operation may to a certain extent be applicable to individual cases none of them are free from objection and may indeed be wholly inapplicable in certain circumstances.

The author describes his operation whereby a new duct is formed which unites the stump of the common bile-duct with the duodenum. A rubber tube is sutured into the end of the duct with catgut, and a flap is cut from the anterior wall of the duodenum, being so fashioned that its base is below. The opening which is left by the turning down of this flap is then sutured in its upper part until it will just admit the rubber tube, which is inserted and the duodenum fixed as close to the common bile-duct as possible. The flap of duodenal wall, which consists of mucosa, muscle, and peritoneum, is then carefully sutured around the tube and an in the end of the severed duct, thus forming a new portion of duct bridging over the gap. The tube being entered only by catgut is after a short period passed into the bowel, and thus is not likely to give rise to the formation of stones.

Walton reports a case of complete recovery by this method. He claims that the new duct can be made practically any length and that it is applicable to all cases. It is formed of all three coats of intestine and thus is not only impervious to the action of the bile but is unlikely to contract. The opening in the duodenum is more or less valvular so that regurgitation is unlikely to occur.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Da Costa, J. C., Funk, E. H., Bergelm, O., and Hawk, P. B.: *Osteitis Deformans; Five Cases with Complete Metabolism Studies in Two Instances*. *Report Jefferson M. Coll. & Hosp.*, 1912, vi, 1.

Osteitis deformans is the name given to a chronic inflammation of bones by Sir James Paget in 1876. The authors report 5 cases and in a review of the literature have found out additional cases. Cases reported as early as 1876 have been considered by Paget to be similar to those described later. The disease is rare, as is shown by the fact that only 3 cases were found among 30,000 admissions to Johns Hopkins Hospital and 3 in 38,000 at the Jefferson.

The family history in the first case, a woman aged 33, shows one sister with similar trouble. The patient's present illness began 12 years ago with bending of the left lower leg. Two years later aching pain began in the back, pelvis, and right thigh. Since then nearly all the bones have become involved and she has lost seven inches in height. The principal points in the physical condition were: slight enlargement of the head; trunk increased in anteroposterior diameter; abdomen short and wide; thickening and outward bowing of the left femur, tibia and fibula, and the right femur; thickening of the left femur; marked

genu varus; thickening and curvature of all the bones of the arms; hand and foot bones normal. The urine and blood were normal; Wassermann negative. Bones with beginning involvement showed decrease of mineral salts; those in advanced stages showed irregular redeposits of salts. The surface was wavy but not rough; the medullary canal was filled in places with new bone; the articular surfaces were normal.

The family history of the second case, a woman aged 34, was negative. The personal history was not remarkable. No fractures. The present trouble began two years ago with limping pain in the right leg and thickening and bending of the right tibia. Pain still persists and is worse on exercise. There has been no loss in height but there has been a loss of 20 pounds in weight in the last year. Physical examination showed the head enlarged; cephalic index 81.7; thorax and abdomen normal; right tibia nearly twice as thick as the left and bowed outward; fibula and femur of same side also thickened. Bones of left leg normal. Urine and blood normal. Wassermann negative.

The third case, a man aged 38, suffered a fracture of the forearm at 14, which healed with good result. Lumps began to develop on the head at 8 years of age. There were no subjective symptoms. The head showed enlargement of left frontal and right temporal bone. Roentgen picture showed thickening particularly of outer table. Blood, urine, and Wassermann, negative.

A study of a larger number of cases shows the average age of onset to be 40, but many cases are reported beginning between 8 and 50. Sixty-seven per cent of cases occur in males. There are 14 instances given of two or more cases in the same family. A great majority of case reports show a negative Wassermann; however, Lannelongue and Fournier hold that it is a late manifestation of hereditary syphilis. No bacterial basis could be demonstrated by the authors, but a few cases are reported in which an organism was isolated from the bones. There is some evidence that the ductless glands play a part in the etiology. One case of the authors showed atrophy and two hypertrophy of the thyroid. Two showed enlargement and atrophy of the pituitary gland. Pain as a symptom is usually present in the early stages but not constant, usually referred to the back and legs. Headache is not common even with involvement of the cranial bones. The deformity is most frequent in the long bones especially the tibia. Gradual enlargement of the skull is the first feature in some of the reported cases.

Fractures are not features of this disease. Of 158 cases 14 developed malignancy, the tumor occurring either in the healthy or diseased parts of the bone. Of 8 patients traced to the end, 5 died of sarcoma. The authors made careful metabolism studies in 2 of their cases. Calcium, magnesium, phosphorus, sulphur, and nitrogen were determined in the ingested food and in the urine and feces. It was found that a much higher percentage of calcium was retained by the patient than in normal individuals and that a lower percentage of sulphur was retained. This condition is opposite to that in osteomalacia in which the body gains sulphur and loses calcium. In other words, there is in osteitis deformans a gain of inorganic and loss of organic matter, while in osteomalacia the condition is reversed. Normal bone contains approximately 40 per cent organic and 60 per cent inorganic matter; bone in osteomalacia is about 70 per cent organic and 30 per cent inorganic; in osteitis deformans the proportion is approximately 20 per cent organic and 80 per cent inorganic.

In these experiments the nitrogen loss was not proportionate to the sulphur loss as might be supposed if these losses were due to catabolism of bone matrix, but this is explained by the greater conservatism of the organism for nitrogen, which results in its being resynthesized into other structures while the sulphur is eliminated. These findings are interesting in connection with the theory of decreased parathyroid function as an etiological factor in osteitis deformans. Since it is known that parathyroid insufficiency leads to disturbance of calcification, it might easily be inferred that decreased activity of the parathyroids is the cause of the retention of calcium and abnormal use of that element in overproduction of bone less compact than usual.

W. A. CLARK.

Zahradnický, F.: Gunshot Injuries of the Large Joints (*Die Schussverletzungen der grossen Gelenke*). *Cas. Mh. Čech.*, 1919, No. 23-25.

Among 2,331 injuries, 140, or 6.3 per cent, were gunshot injuries of the large joints. The one most frequently injured was the knee-joint, then the shoulder, the elbow, the ankle, the wrist, and least frequently the hip-joint. The joints of the left half of the body were more frequently injured than those of the right. The elbow was the only joint that was more frequently injured on the right side. Of the wounds 88 per cent were made by small calibered bullets, and 12 per cent with shrapnel or grenades. In 91.3 per cent of the cases the bullets passed entirely through the joint, in 8.7 per cent they lodged. This was because so many of the injuries were caused by rifle bullets. There were multiple injuries in 13.4 per cent of the cases.

Of the 140 cases, 57, or 38.2 per cent, were infected, 49 of them being bullet wounds and 8 shrapnel or grenade injuries. Forty-three cases, or 28.8 per cent were operated upon, all of them being infected cases. Resection was performed in 25 cases, or 16.7 per cent, with one death from sepsis, or 4 per cent; arthrotomy with drainage was done in 11 cases, 7.9 per cent, with 1 death from sepsis, 9.9 per cent; arthrotomy with necrotomy in 5 cases, 3.7 per cent; amputation in 2 cases, 1.5 per cent. Of the 140 patients, 2 died, 1.3 per cent.

The results on dismissal from the hospital were as follows: In the aseptic cases, of 19 gunshot wounds of the shoulder, 13 were good, 3 poor; of 5 of the wrist-joint, 4 good, 1 poor; of 19 of the knee, 15 good, 4 poor; of 5 of the ankle, 4 good, 1 poor. The results in the 64 aseptic cases were in 51 cases good, 79.7 per cent; in 13 cases poor, 20.3 per cent. Infected cases: shoulder 13 cases, 1 good, 12 partial ankyloses; elbow 4 cases, 1 good, 2 partial ankyloses, 1 total ankylosis; wrist-joint 5 cases, 1 good, 4 partial ankyloses; hip-joint 2 cases, both total ankyloses; knee-joint 11 cases, 3 good, 6 partial ankyloses, 2 total ankyloses; ankle-joint 4 cases, 1 good, 2 partial ankyloses, 1 total ankylosis. In all 38 infected cases with 7 good, 18.4 per cent, there were 27 partial ankyloses, 71 per cent, and 4 total ankyloses, 10.6 per cent.

In the aseptic cases the result was good in four-fifths of the cases, poor in one-fifth; that is, pain swelling of the joint or limitation of movement persisted. After the work was finished 51 new cases were added, distributed as follows: shoulder-joint 8 cases, 1 infected; elbow 5, 2 infected, both resected and drained; hip-joint 1 case, secondary empyema in fracture of the femur, necrotomy; knee-joint 28, 5 infected—3 of them drained with one death; ankle-joint 9, 2 infected, both drained. Altogether Zahradnický treated 200 gunshot injuries of the joints, of which 133 were aseptic, 67 infected. There were 4 deaths from severe sepsis, or 2 per cent.

A. Goss.

Seaborn, E.: *The Treatment of Arthritis. Canad. Pract. & Rev.*, 1913, 41, 433.

In considering arthritis, we must understand the capacity of repair of the various constituents of the joint.

Bone has a great capacity for withstanding attack through its power of proliferation and repair.

The capsule is most resistant, and persists through any irritation though it has no power of regeneration.

The synovial membrane is capable of marked hypertrophy, but the new tissue resembles granulation tissue and is phagocytic.

The cartilage is least resistant, and is incapable of regeneration.

The author classifies arthritis as (1) septic, and (2) rheumatoid.

Septic arthritis occurs as the result of traumatism and following various infectious diseases. The organism is demonstrable in the fluids of the joint or in the capillaries of the synovial membrane.

Rheumatoid arthritis occurs in the course of chronic malarial infection. The organisms are not as a rule found as above, but may be found with difficulty encapsulated in any new formations, but much more easily in the adjacent lymphatic glands.

The anatomic changes in a diseased joint are: (1) serous effusions, which may be sterile; (2) hypertrophy of synovial membrane, fringe formation resulting in destruction of cartilage; (3) purulent arthritis; (4) erosion of cartilage, followed by organization of synovial fringes, and fibrous ankylosis; (5) bone may be deposited in the fibrous tissue, resulting in bony ankylosis; or (6) exostosis may result from chronic irritation.

In the treatment we must consider that cartilage is least resistant and must be first protected, this is done by extension.

In infectious arthritis, serous effusion may be helped by rest, pressure, and occasionally by aspiration. This treatment is also applicable to villous arthritis.

In purulent arthritis the joint should be aspirated and injected with a per cent formalin in glycerine, every two or three days.

Fibrous ankylosis should be treated by massage, passive motion, and forcible manipulations. Bony ankylosis is rare & extension is used.

If position is not good an arthroplasty may be undertaken. New bone formations may have to be removed.

The constitutional treatment of septic arthritis is that of the causative disease. Autogenous vaccines may be made from the joint or other foci.

In rheumatoid arthritis, all foci of infection must be removed. In many cases when the offending organism cannot be found, they may be secured by culture from the lymph-glands draining the joint. Vaccines may be prepared and are very valuable.

ARTHUR O'REILLY.

FRACTURES AND DISLOCATIONS

Scudder, C. L.: *The Operative Treatment of Fractures. Russ. M. & S. J.*, 1913, 40, 346.

Four important factors have had a direct bearing on the development of fracture treatment during the past seventy-five years: anesthesia, rendering painless manipulation possible; asepsis, by which compound fractures are assured safe cure; roentgen ray, visualizing results; autogenous bone-graft, the ideal fixation method. These four epochs entered approximately twenty-five years apart from 1846 on. Nevertheless results are still poor and present methods of treatment unsatisfactory.

Recent industrial legislation and social movements have placed emphasis on the economic loss from fractures in working men and the efficiency of treatment as measured by the time elapsing from the injury to resumption of work. Coupled with this demand by the industrial world for better results, there is the desire arising in the profession for more careful and scientific work in this field of surgery. In choosing from the available methods, operative and non-operative, one is confronted with abundant evidence of good results in both methods and with the experience of skillful men at either extreme. Bardenheuer, for instance, contending that exact anatomical approximation is not necessary to good functional results, practically never operates, while Lane operates on all fractures to secure accurate approximation.

The author believes that much harm has been done by indiscriminate operations by surgeons following the method made popular by Lane. He also voices the usual stereotyped warning that operations upon fractured bones should be done only by "surgeons of very considerable general surgical experience."

If properly chosen and properly performed operative treatment will preclude disastrous results, such as non-union, osteomyelitis, painful, stiff, and disabled joints near the fracture, just as surely as careful surgical treatment can prevent disastrous terminations in case of a gastric ulcer. The author operates more on fractures of the femur than he formerly did, especially in adults and if the fracture is transverse or slightly oblique. Better alignment is secured thereby, particularly of the normal anterior curve which is too often forgotten. The solution of the present inadequate handling of fractures is to be found in more intense specialization in surgery, to the end that in each community there may be men who are particularly interested and trained in bone surgery.

W. A. CLARK.

Davison, C., and Smith, F. D.: *Autoplastic Repair of Recent Fractures. Surg. Gynec. & Obst.*, 1914, 18, 366.

Autoplastic bone surgery is a satisfactory and dependable method of repairing skeletal defects and is especially applicable in the repair of a certain class of recent simple fractures, acting in sharp con-

trast to the use of metal plates, screws, and nails. These are resented by the tissues and invite infection while the living graft resists infection. The method will eventually eliminate the Lane plate in the repair of recent fractures. Autoplastic repair is especially indicated in that group of fractures in which it is necessary to expose the fracture by incision to effect reduction, requiring also internal alignment with fixation and external immobilization. The transplant maintains the reduction and grafts to the compact bone of the host under the following conditions: aseptic wound; a living transplant from the same individual without periosteum; graft in contact with the bone of the host and absolute external immobilization.

Occasionally the graft is absorbed, but the majority will remain intact. It unites to the compact bone of the host by the formation of osteoid tissue. Many bone-cells in the periphery of the graft remain viable while those situated in the center undergo necrosis. Eventually there is established in the graft a permanent circulation. The transplant is ultimately transformed into a complete osseous entity continuous with the compact bone of the host. As the functional demand upon the graft is removed, it undergoes absorption in from two to five years. The fate of the graft placed into cancellous tissue is identical with that of any other transplant. Many trabeculae are deposited about the graft between the trabeculae of the host, forming a more compact cancellous structure, but as the functional demand decreases the new bone is absorbed.

Sixteen roentgenograms and three photomicrographs are shown to substantiate the above deductions.

Boardman, W. W.: Pseudofracture of the Sesamoid Bone of the Big Toe. *Surg., Gynec. & Obst.*, 1915, xii, 394.

Boardman reports five cases of division of the sesamoid bones of the big toe, and reviews the literature to date. From this study he concludes that congenital division of the sesamoids of the big toe may occur, usually bilateral, and most often in the tibial sesamoid. The line of cleavage is usually transverse. However, cases are reported, showing a division into four parts. Trauma, direct or indirect, applied to such a foot may be followed by pain, tenderness, and swelling beneath the sesamoid. Trauma, direct or indirect, may also result in a true fracture of a normal sesamoid, with a similar train of symptoms. Hence the differentiation of the two conditions is often difficult, fracture being favored by the irregularity of the line of cleavage, its presence on one side only, the occurrence of fractures of adjacent bones or by the occurrence of healing. The symptoms probably result from a low grade inflammation of the metatarsophalangeal joint. Treatment should be conservative, consisting in rest and protection, operative removal of the fragments being reserved for resistant cases.

Sympton, E. M.: Congenital Dislocation of Right Foot with Almost Complete Absence of Right Fibula. *Brit. M. J.*, 1915, ii, 452.

The author reports the case of a lad aged 13, who was admitted to the Lincoln County Hospital with a malformation of leg and foot which had been noticed at birth. The patient walked at the usual age, resting the right foot on the right great toe. He ran well, played football, etc., became a scout when 11, and did all the drills and marches without difficulty. A year ago he began to suffer from backache after long walks, due to the tilting of the pelvis from the shortness of the right leg. Last March this deformity was noticed by the medical inspector at school, and found to be very marked.

Upon examination the right foot seemed as though it had been rotated outwards for nearly a quarter of a circle and then turned over so that its dorsal surface extended almost directly forwards and its plantar surface backwards. The power to move the foot on the ankle existed, but the movement was backwards and forwards instead of up and down. The boy walked on the end of the tibia which was enlarged and made a good "stump." There was a shortening of 2.5 inches of the right tibia (measuring from patella to inner malleolus), and, of course, owing to the absence of the foot beneath the tibia there was much more difference in the total length of each limb.

On June 5, 1915, a flap was formed from the dorsum of the foot, the tendons and ligaments were divided, the incision carried upwards and downwards over the os calcis, the tendo achillis cut, the flap turned upwards and outward, making the wound like an inverted U. This healed by first intention, and the scar is well out of the way of any vertical pressure.

M. S. HENDERSON.

SURGERY OF THE BONES, JOINTS, ETC.

Gemmell, W.: An Operation for the Obliteration of the Cavity in the Tibia Remaining After Sequestrotomy. *Brit. M. J.*, 1915, ii, 432.

The author cites a case of a man, aged 61, who had a large cavity in the head of the tibia as a result of a former operation for sequestrotomy. The cavity was closed by the removal, subperiosteally, of a wedge of bone, longitudinally, on either side of the cavity, and forcing the roof down on to the floor bringing into contact the previously curetted walls of the cavity. Accuracy of the bone-flaps is quite necessary for a good result, which in the above case proved to be quite satisfactory.

C. H. BUCHOLTZ

Brown, W. L., and Brown, C. P.: Further Observations on the Fate of Free Bone Transplants. *J. Am. M. Ass.*, 1915, lxx, 1007.

By permanency in bone-grafts the authors mean that the graft should last as long as the life of the patient. In this sense they hold that no grafts are permanent, as they are all ultimately absorbed,

whether with or without periosteum, and any supposed growth reported by some observers is only temporary. Exception is taken to the statement of McWilliams and Allen that periosteum is important in supplying nourishment to the graft, in view of the fact that living bone does not depend upon the periosteum for blood supply since the vascular connection between the bone and its covering is very slight. Whatever delay in absorption there may be in perosteal grafts, as compared to the aponeurotic type, is due not to nourishment supplied but to the mechanical protection which such a covering affords.

If it were true that circulation was the all important factor and the periosteum the source of the blood, then the greatest growth and the longest life should be found in grafts covered completely, or nearly so, with periosteum. Such a specimen is obtained from the spine of the scapula, but the authors' experiments with it show that when transplanted it is absorbed; in one case it was completely absorbed in thirty-nine days. Experiments with osteogenic function of the periosteum showed (in all except one experiment) that it did not possess such function.

Subperiosteal resections of one inch of ulnar were made in the right and left legs of a dog. On the right the ends were covered with caps of thick tin-foil and only a small extension of bone grew down from a point above the cap on the proximal end, while on the left the gap filled in completely with solid union. This seems to indicate that regeneration is from the ends of the bones rather than from periosteum.

W. A. CLARK.

ORTHOPEDICS IN GENERAL

Batten, F. E.: Unusual Manifestations of Poliomyelitis. *Can J.* 1941, 18V, 395.

The author reports several cases showing some unusual conditions in patients suffering from poliomyelitis, at least they were so diagnosed. In one case there were violent spontaneous movements of an athetoid character in the left hand. In another case there was rigid extension of the legs at the hips, due apparently to pain on attempted motion. In the third there was marked rigidity of the right leg in a flexed position. In the fourth there was marked involvement of the neck muscles and none of the legs, arms, or trunk. In the fifth the probable diagnosis of poliomyelitis occurring during intra-uterine life was made. In the sixth there was ataxia and probably a focus of the disease in the cerebellum. The last two cases are given as evidence that poliomyelitis may produce a toxic poliomyelitis.

GEORGE I. BOUMAN.

Hoke, M., and Hodgson, F. G.: Cases Illustrating Orthopedic Treatment of Some of the Disabilities Resulting from Infantile Paralysis. *South M. J.* 1941, 54, 788.

The authors state that with the exception of paralytic scoliosis, the deformities of infantile

paralysis can be entirely corrected, and the lameness greatly decreased by surgical procedures of orthopedic nature. They present several very excellent rules for the surgical treatment of infantile paralysis, as follows:

1. The plan of campaign should look forward to the minimum use of, or preferably the entire removal of, the apparatus.

2. To accomplish this, operation should be done which will enable the skeleton to bear weight so that the tendency to relapse after deformities have been corrected will be removed.

3. The tendon transplantation and the insertion of silk ligaments are of value only when the skeleton is properly balanced.

4. Accurate skeleton balancing operations remove the necessity for the use of braces in most cases, although braces have their periods of usefulness.

5. Without prolonged post-operative massage and muscle training, operations are largely useless.

DEBORAH P. WELCH.

Stone, C. A.: Treatment of Congenital Club-Foot. *J. Mo. St. M. Ass.* 1941, 38, 400.

The author urges the early treatment of club-foot, and advises that correction should be begun as soon after birth as possible. He reviews the various theories of the cause of club-foot. He believes that the periods of ossification of the various tarsal bones may play an important part in the etiology. He says that in considering the time of ossification of the tarsal bones the fact struck him that since the calcia, astragalus, and cuboid centers appear at 6, 7, and 9 months respectively, and remembering that the internal muscles are stronger, then given a predisposing factor, we have the explanation of 80 per cent or more of club-foot.

The treatment is operative and non-operative. The non-operative consists in gradual correction with anesthesia. The foot is held in as nearly a correct position as possible. It is well padded by cotton and a plaster cast is applied, with the knee flexed, the bandage starting on the inner side of the foot running across the bottom, across the dorsum to the starting point, and continuing up the leg to well above the knee. The cast should press against the great toe, and room should be left on the outer side for swelling. The plaster is changed every week or ten days, until correction is secured; the varus is first corrected and then the equinus. When correction is secured, the plaster is carried to the knee and the patient is allowed to walk upon it. Later, massage and manipulation are used, and a broad-toed shoe raised one-fourth inch on the outer side is worn. The danger of relapse is pointed out.

In infants the author uses a celluloid splint which may be removed, allowing massage and manipulation.

In older children, correction may be secured by manipulation under anesthesia, with tenotomy of the plantar fascia and tendo achillis if necessary.

If the deformity is resistant, the removal of a wedge is safer and quicker than more forcible manipulation.

The author does not attempt forcible correction for ten days after operation, at which time the wound is healed and there is less danger from trauma and swelling.

The second manipulation is done under anæsthetic. The after-treatment is the same as in non-operative cases.

The author's conclusions are as follows:

1. Club-foot should be corrected at once, then anæsthetics and operation are unnecessary.
2. Older babies need tenotomies before proper correction can be done.
3. Bruising of the resistant foot should be avoided, and even if the child is young less damage is done by the knife.
4. In older children with badly deformed feet tenotomies alone should not be attempted. The removal at once of a wedge of bone will save the patient much time and pain.
5. Any club-foot can be corrected, but it is very important that the responsible parties be made to understand that they will have to do their share, and that it will usually take a long time.
6. The best form of appliance to keep club-foot

in position is plaster of Paris; muscle atrophy is negligible.

ARCHER O'KEEFEY.

Soule R. E.: The Bone-Pin Graft in Painful Flat-Foot, Paralytic Valgus, and Other Painful Deformities of the Foot. *N. Y. M. J.*, 1915, vii, 350.

The author refers to his method of ankylosing the astragaloscaphoid joint in the above conditions, and describes in detail a supplementary procedure to strengthen this arthrodesis.

The astragaloscaphoid joint is exposed through a dorsal incision, the articular surfaces are thoroughly removed and the foot adducted to the normal position. With an electric motor drill a hole is made through the scaphoid into the head of the astragalus. A bone pin is prepared from the tibia and driven through the drill hole above mentioned, holding the bones firmly and accurately.

A plaster splint holds the parts in position for six or eight weeks, after which an adhesive plaster strapping is relied upon to give further support for a time, while the first attempts at walking are made. Two patients operated upon in this manner walked without crutches or canes twelve weeks afterward.

F. J. GAESLEN.

SURGERY OF THE SPINAL COLUMN AND CORD

Second Report of the Committee on the Treatment of Structural Scoliosis to American Orthopedic Association. *Am. J. Orth. Surg.*, 1915, viii, No. 1.

The committee in its second investigation had each physician whose work was to be reviewed, present a new series of six previously untreated cases. These cases were examined and recorded by one or more of the committee before treatment was begun.

The record of the deformity consisted of stereoscopic photographs of the back of the patient, both the standing and the forward bending positions, and of röntgenograms in the recumbent position. Both were standardized by means of the apparatus provided by Bucholz and Osgood.

After six months' treatment the cases were again examined in the same manner. The cases were divided and grouped according to the initial severity of deformity. There were three groups of methods presented: (1) after the method of Lovett; (2) after the method of Forbes; and (3) after the method of Abbott.

The author considers the report fair and just and gives the summary as offered by the committee as the result of its second investigation:

"1. No case of overcorrection of the elements of deformity in structural scoliosis has been presented to the committee, in which it has been permitted to observe and record the condition of the patient from a time preceding the beginning of treatment.

"2. The time allowed by the committee has been sufficient in its judgment for such a demonstration, were it possible in the respective patients and by the respective methods.

"3. The same statements may be made with respect to complete correction of the elements of deformity.

"4. The amount of correction demonstrated to the committee by means of the method of Forbes is unsatisfactory and is to be regarded as an entirely insufficient reward for the amount of labor, discomfort, and other inconvenience which is involved.

"5. In mild cases of undoubtedly structural scoliosis, and perhaps in some moderately severe cases, considerable degrees of correction may be achieved by means of the method of Lovett and Abbott and by Kleinberg's brace.

"6. It seems probable that greater degrees of correction may be obtained with the flexed, than with the extended, position of the spine.

"7. It does not appear that the use of extreme force is justified by the results which are to be obtained from it.

"8. In order to have reciprocal application to the given case, all records should be made with the patient in the same position; this refers to the clinical, photographic, and röntgenographic record and to the horizontal or upright position of the patient.

"9. For purposes of record the upright position is to be preferred."

J. O. WALLACE.

Kleinberg, S.: The Treatment of Rigid Rotary Lateral Curvature of the Spine by a New Brace.
N. Y. St. J. Med., 1913, 17, 319.

Kleinberg describes a new brace to take the place of the Aldert cast in scoliosis. This apparatus consists of thoracic and pelvic steel bands crossed by several upright bars for attaching canvas bands for pressure. It is made by outlining a pattern over a plaster torso from a temporary Abbott cast made in extreme correction. The advantages of the brace over the cast are several: the patient is more comfortable and gets used to the apparatus quicker; the brace is much lighter; the corrective pressure more gradual; more of the chest is exposed for watching progress; and only one brace necessary.

Cases favorable for treatment are: single curves of moderate degree, long dorsal with short compensatory lumbar curves, mild S-shaped curves, moderate lower dorsal curve with very little compensatory curve.

Unfavorable cases include: curves with sharp angulations, high dorsal curves, marked lumbar distortion, severe S-shaped curves, and congenital malformations.

Of the author's 30 cases, 11 showed marked improvement, 8 mild improvement, but not one showed complete correction. He concludes that though the treatment must be protracted, it does obtain good results in mild and moderately severe types, and that the brace accomplishes the result as well as the plaster.

ROBERT G. PARKARD.

Wilson, J. C.: Bone-Graft for Tuberculosis of the Spine. *Internat. J. Surg.*, 1912, 11:10, 200.

Following a very brief review of the history, Wilson describes his method of bone-grafting in tuberculosis of the spine and cites 20 cases.

The graft is obtained from the internal surface of the tibia, and is about three-fourths to three-eighths of an inch wide and of sufficient length to extend well above and below the affected area.

The spinous processes in the diseased area are exposed by a semi-elliptical incision and split by an osteotome or a heavy cartilage knife, care being taken not to separate the posterior spinal ligaments from the spinous process. The graft, being scarfed if necessary to facilitate bending, is laid between the split processes and held in place by suturing the ligaments as near the separated portions of the processes as possible over the graft. The skin and subcutaneous tissues, closed by silk-worm gut, further hold the graft in place. The patient is then kept prone in bed for four weeks.

In cutting the graft Wilson recommends the Allier saw, but says that the ordinary, semi-elliptical plaster saw may be used, care being taken not to fracture the graft.

He gives a report of 20 cases in which this method was used with success. He concludes that this procedure is rational and safe, and is to be considered in all cases with symptoms of an active process, provided the general condition will permit of operation.

PHILLIPS M. CHASE.

SURGERY OF THE NERVOUS SYSTEM

Borchardt, M.: Gunshot Injuries of Peripheral Nerves (*Schussverletzungen peripherer Nerven*). *Arch. f. Klin. Chir.*, 1912, 89:1, 212.

As consulting surgeon of the third army corps and surgeon of the military prisoners at Zossen, Borchardt has seen several hundred cases of nerve injury, and has operated upon more than 70. In this article he gives the histories of 56 cases. Of the series, 17 were injuries of the radial, 8 of the median, 7 of the ulnar, 7 of the ulnar and median, 1 of the musculocutaneous, 8 of the brachial, cervical, or lumbar plexus, 8 of the sciatic. Excellent plates are given, containing 35 illustrations showing the operations.

The indications for operation were decided upon according to the principles laid down by Oppenheim, Cassier, and other noted neurologists. Operation was performed when the neurological findings indicated that there was severe injury of the nerve, either from partial or total section of the nerve or from scar formation around it. He operated if there was complete motor paralysis, complete reaction of degeneration, or severe disturbances of sensation. Operating on these indications he met with negative findings on operation in only 2 cases. Among the 56 cases, in 18 the

nerves were found completely, and in one partially, severed. The stumps were generally swollen, with club-shaped ends. In the other cases there were more or less extensive scars, and sometimes foreign bodies were embedded in the nerves, such as bits of metal or cloth, fragments of bone or muscle fibers.

In operation the greatest care was taken to control hemorrhage so as to avoid the formation of even the smallest hematoma, which might lead to renewed scar formation. If the tissue around the nerve showed cicatricial changes, a sheath of fat or soft fascia was put around the nerve. The chief factors in the early restoration of function are careful suture, absolute asepsis in operation, the avoidance of hematoma and early movement, massage, and electrical treatment.

Direct suture is to be preferred to all other methods. Care must be taken in suturing to bring the corresponding nerve-tracts into exact apposition. The muscles should be spared all injury so far as possible. If palpation or exploratory incision shows artificial tissue it should be excised. Of course the ideal procedure would be to replace into normal nerve-tissue, but the histological examination of apparently normal cross-sections of nerves gave surprising results. The plates show some

histological pictures of cross sections of nerves that were apparently normal, but the microscope reveals the fact that they contain considerable cicatricial tissue, and in some places there are no nerve-fibers left at all, or else there are only tubes of nerve-tissue filled with scar tissue. But Borchardt believes, as does Cassirer, that it is better to suture such nerves, even though they contain some scar tissue, than to remove such large pieces that they cannot be sutured together. If only a part of the nerve is injured, electrical examination will show what part of it should be resected.

Borchardt recommends that operation be done as early as possible, because it is technically easier then, and because early operation prevents contractures of the muscles and joints and trophic disturbances. In the author's own cases the time between the injury and the operation varied from two weeks to nine months. In 6 cases there were also injuries of the vessels, but the vessel wounds closed spontaneously without the formation of aneurisms. Among the 56 cases, 25 were under observation longer than three months; 21 of these were improved and 4 not improved. The results were particularly good in 3 cases of nerve-suture, function being completely restored. Borchardt believes that the results of operation have been given more praise than they deserved. A. Goss.

Grosse: Gunshot Injuries of Peripheral Nerves (*Schussverletzungen peripherer Nerven*). *Beitr. z. klin. Chir.*, 1915, xxvii, 300.

Grosse reports 33 cases which he has operated upon. He always operates without cutting off the circulation from the limb, dissects away all cicatricial tissue as far as possible, and resects the nerve-stumps thoroughly. He sutures the nerves with fine silk and round needles, and when possible embeds them in muscle tissue, without putting any sheath around them. But where the nerve must pass through scar tissue, he makes a sheath for it of a calf's artery, which he prepares like catgut and keeps ready for such cases. These cases have all healed uneventfully, even when the wound was infected when the operation was performed.

Among 20 operations, 13 of suture, 6 of neurolysis, and 1 of splicing, performed from October, 1914, to March, 1915, there were good results in 8, partial results in 6, and in 6 no result. Of 17 further operations, 11 of suture, 5 of neurolysis and 1 of splicing, from April to August, 1915, 4 have shown good results, 1 partial success, and 12 thus far no result. All the good results were in the upper extremity. The time until function was restored varied from three weeks in a case of suture of the radial to 7 months in a case of neurolysis. A. Goss.

Bittorf, A.: Gunshot Injuries of the Peripheral Nerves (*Über Schussverletzungen der peripheren Nerven*). *Neur. Zentralbl.*, 1915, xxiv, 138.

Bittorf divides gunshot injuries of peripheral nerves into two groups. The first and larger group

includes the injuries of the radial, the brachial plexus, the sciatic and its branches. Motor paralysis is the prevailing symptom; disturbances of sensation are slight or entirely lacking. Pain is rare, though it sometimes appears in injuries of the sciatic. The prognosis is unfavorable, for the time required for recovery is very long. Even in cases where operation has not shown any severe injury, total paralysis often persists after many months. In the second smaller group the disturbances are chiefly vasomotor, secretory, and trophic. Subjective disturbances of sensation and extreme pain are common. Injuries of the median and ulnar generally belong in this group.

The prognosis even without operation is quite favorable. In the first group early operation is recommended. An unnecessary operation does no harm. Even by waiting one is not always prevented from performing such operations, but with the lapse of time the conditions for operation become more unfavorable. Passive movements of the joints are necessary in all cases to avoid stiffness and contractures. In the second class of cases conservative treatment is preferable—hot air, vapor baths, and electrical treatment. A. Goss.

Tuffier, T.: Treatment of Injuries of the Nerves by Projectiles (*Traitement des lésions des nerfs par projectiles de guerre*). *Bull. et mém. Soc. de chir. de Par.*, 1915, xli, 1911.

Tuffier reported the work of Dumas on 280 cases of nerve lesions during the war. From his results he concludes that section and suture of the nerves should be practiced only when no other treatment is possible. Among his 280 cases, nerve-suture was practiced in only 10, and in none of these cases was motion restored.

The treatment of choice is to liberate the nerve from scar tissue and make a sheath for it of some substance that will protect it from further cicatrization. The nerve should be handled as little and as gently as possible, and the cicatricial tissue developed within the nerve itself should not be touched. Even where the nerve has been completely severed the conservative method is still indicated.

Dumas reports a case to illustrate his method of leaving a bridge of sclerotic tissue about the size and shape of the nerve between the severed ends. Gradually nerve-fibers grow through this from the distal to the peripheral end and function is restored. After the nerve is freed it must be protected, and he finds that the best material for this purpose is fatty tissue. This may be taken from the patient himself or from some one else. Its softness and elasticity make it an ideal material for protecting the nerve from compression by new-formed scar tissue. Other materials frequently used, such as hernial sac, veins, and aponeurosis, are not thick enough to give as efficient protection.

He has found this method particularly effective in those very painful lesions of the median nerve

which many operators have reported as hopeless. In 37 cases of very painful paralysis the pain has disappeared, except in one extremely stubborn sciatic case. In 111 cases in which fat was used he has never seen the slightest bad effect from its use.

A. Goss

Stoffel, A.: The Technique of Neurolysis. (*Über die Technik des Neurolyses.* Deutsche med. Wochenschr., 1915, 41, 1441.)

Stoffel has recently had occasion to examine a number of soldiers on whom neurolysis had been performed, and found that the results were very unsatisfactory. This was due to the fact that the operators had merely freed the nerve as a whole from scar tissue and enveloped it in muscle or fascia. This is not sufficient. The nerve is made up like a cable. When it is injured there is not only effusion of blood and formations of scar tissue around the whole nerve, but the individual cords of the cable may be bruised or torn, the connective tissue between them is injured, and scar tissue is formed within the cable.

In operating the surgeon should consider not only the perineural cicatricial tissue, but the endoneural scar tissue. The perineural scar is first carefully dissected off. Then the individual nerve tracts should be taken up one at a time and followed through the injured region. If the endoneural connective tissue is soft and the individual nerve-cords are soft there is no endoneural scar; but if the nerve feels hard and the individual bundles are hard to separate from one another there is intraneural scar tissue. Great care must be exercised in separating the individual bundles not to injure them.

This technique requires considerable skill on the part of the surgeon and accurate anatomical knowledge of the nerve with which he is dealing. The motor tract should be attended to first; the sensory ones are of secondary importance. When all the tracts have been freed from scar tissue the whole nerve is enveloped in whatever substance has been chosen for the sheath. Stoffel has been using calves' arteries hardened in formalin, but recently has been using calves' peritoneum hardened in the same way, because it is not so thick as the arteries. He has found that the nerves heal much more quickly if they are fixed in a relaxed position, so he fixes the joint for three or four weeks in a position so that the nerve will be relaxed. Sometimes he finds that individual cords in the nerve-cable are injured to quite different degrees, so that some of them require to be severed and sutured, while others do not. He has frequently done nerve-suture for part of a nerve and neurolysis for the rest. By using this technique he has had surprisingly good results in practically all of his cases.

A. Goss

Law, A. A.: Some Modern Phases of Neural Surgery. *St. Paul M. J.*, 1915, LVII, 136

The author gives his personal experiences and observations on the recent advances in neural sur-

gery. He holds that the theory which applies best to regeneration of nerves is that which postulates that all nerve regeneration must take place from the proximal ganglionic cells and axones, the latter projecting themselves outward in an effort to bridge the nerve deficiencies. He does not uphold the theory of Forssman, who believes in the chemotactic action of nerve tissue on regenerating nerves. He lays special emphasis on the importance in accurately suturing nerves that have been severed, so as to avoid a neuroma. He draws attention to the refutation of a nerve with a highly specialized function when that nerve has been implanted into an ordinary motor nerve. He does not advocate cutting flaps from nerves in order to bridge defects, because the viable axones are cut across and destroyed, a raw nerve area is exposed to cicatricial contraction and the ends of living axones are not approximated. It is important that the ends of the proximal axones be cleanly sectioned with a sharp knife and not crushed by scissors. In suturing nerves he advocates the use of chromic catgut sutures which are passed through the nerve-sheath alone. Silk, he thinks, acts more as a foreign body than catgut.

Kid to side anastomosis where a longitudinal slit is cut in a neighboring nerve and the distal fragment of a degenerated nerve is stitched in, may be done successfully provided the slit cuts some of the axones across. He quotes Levings as showing that where the proximal and distal fragments of a resected nerve were implanted between parallel muscle-fibers and protected by these fibers, that regeneration occurred along the plane of the muscle fibers. He thinks that foreign bodies introduced to guide nerve growth, such as tubes of decalcified bone, magnesium or gelatine, cargile membrane, eggshell membrane, wax or paraffine are not feasible, but rather he advocates the use of tubes made of fascia from the patient's own body. He thinks this is a better procedure than bridging the nerve-defects with a sensory nerve, because in the grafted fragments the axones are destroyed, the perineurium alone acting simply as a conduit, where the function of the central sensory nerve is destroyed. Segments of the saphenous vein, he has found, collapse, and the intima grows tightly shut to the intima of the opposite side.

In addition to the value of fascia in making conduits for the outgrowth of nerve, the author has made use of it in replacing defects of the dura.

The time of regeneration in a cut nerve varies markedly from four months to several years. Sensory nerves regenerate first, yet there is never complete restoration of sensation after secondary failure as there is of motion in a motor nerve. Contracted nerves stand extensive stretching without losing their function. Nerves injured in fractures should be exposed and wrapped in fat or aponeurotic flaps for protection, and transplanted to another neighborhood where pressure is relieved.

HARRY G. SLOAN.

SURGERY OF THE SKIN, FASCIA, AND APPENDAGES

Skinner, E. H.: Röntgenotherapy for Angiomata; Report of Cases. *J. Ma. St. M. Ass.*, 1915, xii, 411.

Skinner states that the röntgen treatment of these lesions is based upon biologic röntgen effects which have been proved by experimentation and practice. The tunica intima of blood-vessels is especially radiosensitive, and the application of the röntgen ray in measured filtered doses eventually leads to the obliteration of the vessel channel. The ray also promotes the obliteration and contraction of tissue elements. These biologic effects are desired to promote the involution of hæmangiomata and lymphangiomata. The use of röntgen filters are necessary to prevent the superficial skin or mucous membrane reaction which would certainly ensue

without their use. The amount of filtration will vary with the depth of the lesion beneath the skin surface and the penetrative quality of the ray used.

Skinner advises the administration of massive doses at increasingly longer intervals. The longer the lesion has been under treatment the more rays will be required to obtain further benefit. He reports a case of cavernous hæmangiomata at the inner canthus and two cases of lymphangiomata which were successfully treated. He states that each of these cases presented a difficult, if not impossible, surgical aspect, and the favorable outcome of this class of cases after careful röntgen therapy should promote the substitution of a painless non-deforming röntgen treatment in preference to mutilating surgical procedures.

MISCELLANEOUS

CLINICAL ENTITIES — TUMORS, ULCERS, ABSCESES, ETC.

Walther, C.: Intraspinal Treatment of Tetanus with Large Doses of Antitoxin (A propos de tétanos et de la sérothérapie intrarachidienne massive). *Bull. et mém. Soc. de chir. de Par.*, 1915, xli, 1904.

Walther presented a report of the work of Pignol, Brisset, and Lémonnier in the treatment of tetanus. There has been a tendency recently to give very large doses of antitoxin, no matter how administered. Castaigne has given as much as 760 ccm. in 12 hours. The above authorities have had much better and prompter results by giving the antitoxin intraspinally. They have brought about recovery with less than 200 gm. of serum. After giving the injection they place the patient's body in a slanting position with the head down. Another part of their treatment is careful treatment of the wound, free incision, removal of projectiles, and exposing as large a surface of the wound as possible to the air, in addition to the use of suitable antiseptics. The objection has been urged to their results that they took only favorable cases, those with a long incubation period, but they say they took the cases without selection and that, moreover, a parallel series of cases not given their treatment all died, though some of them had long incubation periods.

Among 36 cases 3 died of complications, septicæmia, pulmonary gangrene, and pneumonia. Of the remaining 33, 6 died, or 18 per cent. Three of these cases were extremely acute forms of respiratory tetanus with paralysis of the diaphragm and the respiratory muscles. Leaving these out of account, gives 3 deaths in 30, or 10 per cent. The treatment should be used more extensively and further statistics collected. A. Goss.

Critie, G. W.: The Phenomenon of Acidosis and Its Dominating Influence in Surgery. *Ann. Surg.*, Phila., 1915, lvi, 257.

Animal as well as plant life demands for its continuance an alkaline medium; therefore, since the activities of life constantly produce acids, the acid by-products of energy must be neutralized. Exertion, emotion, and all other activators of energy transformation cause an increased output of adrenin. They also cause increased acid by-products.

Experimentation has shown that the injection of CO₂ causes increased adrenin output and increased respiration, but no other symptoms; and it has been found further that the brain, the lungs, the adrenals, and the liver are concerned in the neutralization and elimination of the acids resulting from energy transformation, the brain governing the mechanism by which the acetal processes are accomplished.

It is possible to see the trend of a case in which mild acidosis already exists and to apply means by which to ameliorate the physical changes which are caused by the presence in the system of abnormal amounts of acid. Anæsthetics, chloroform, and ether in greater degree than nitrous oxide, produce increased acidity in the blood as well as increased respiratory rate. This explains why the administration of an anæsthetic to a starved patient, with gastric or duodenal ulcer for example, may cause death by precipitating the impending acidosis.

In greater or less degree acidosis is present in every abnormal condition of the body which can be traced to excessive kinetic activations, and the maintenance of the normal potential alkalinity of the body is of vast clinical importance. The factors increasing acid by-products should be controlled as far as possible by the surgeon. The associated operation minimizes these injuring factors, but the

patient should also be protected in advance by being given water, glucose, and sodium bicarbonate, and the post-operative state also may be improved and convalescence hastened by these measures.

Simpson, F. F.: Right-Sided Hypertension with Occasional Cardiac Dilatation as Post-operative Complication. *J. Am. M. Ass.* 1915, liv, 941.

Simpson points out that persons with weakened myocardium from excessive business or social cares, by marked anemia, or by prolonged absorption of bacterial toxins, biliary poisons, etc., are serious risks for surgical operation. To expose such a person to prolonged general anesthesia with the patient in the Trendelenburg position, and later give unnecessarily large amounts of normal salt solution intravenously, increases the dangers.

Experiments were carried out on dogs to make observations parallel to those made on humans. Normal dogs, dogs with hyperthyroidism, with weakened circulation from prolonged general anesthesia, by extreme Trendelenburg position, and by intravenous injections of 0.50 per cent sodium chloride solution were used with interesting and quite conclusive results. Dogs with hyperthyroidism and enlarged thyroids showed the depressive influences of posture, ether, and intravenous injections more quickly and more profoundly than normal dogs.

Analysis of the last 2,000 abdominal operations showed clinical symptoms of right-sided hypertension or cardiac dilatation in 42 patients.

Extensive observations were made on 115 consecutive abdominal operations on the cardiovascular system, clinically, and roentgenographic studies made before and after operation. No typical clinical picture of marked increase in venous tension or acute cardiac dilatation occurred.

Minor changes warranted the following conclusions as regards right-sided hypertension:

1. When the vascular measurements were not relatively greater in proportion to the cardiac measurements, there was no circulatory embarrassment. In 38 cases no embarrassment was observed.

2. When the vascular measurements were relatively greater than the circulatory measurements, circulatory disturbance did occur in 24 per cent of the cases. In 30 cases embarrassment was observed twelve times.

Simpson summarizes his ideas as follows: Right-sided hypertension does occur as a post-operative complication. It is usually slight and causes no alarming symptoms. It occasionally causes circulatory disturbance, always with a rapid pulse. In rare instances it leads to right auricular dilatation or even to dilatation of the entire heart. It is more likely to occur when the myocardium is weakened by disease. It may readily be precipitated or intensified by excessive ether, prolonged extreme Trendelenburg position, or by rapid intravenous injection of large quantities of salt solution while the heart is already embarrassed.

It should be promptly recognized and treated by slight elevation of the head of the bed and the administration of a little morphine and cardiac stimulants.

CARL R. STEINKE.

SERA, VACCINES, AND FERMENTS

Hersfeld, E.: Specificity of the Abderhalden Reaction (Zur Frage der Spezifität bei der Abderhaldenschen Reaktion.) *Deutsche med. Wochenschr.* 1915, xli, 1131.

Hersfeld presents three tables showing the results of the Abderhalden test on the sera of pregnant, non-pregnant, and mentally-diseased women. These tables show that almost all normal, non-pregnant sera catabolize placenta. Of the organs examined, normal serum had the strongest catabolic action on spleen, placenta, and ovary. The pregnant sera also digest these organs most actively. Normal women and women with psychoses showed no appreciable difference in their ability to catabolize different organ tissues. It seems that all sera possess similar catabolic products. They all seem to contain substances that digest albumin, globulins, tissue proteids, glycoproteids, and albumins that are soluble in alcohol. The results of the experiments represented here seem to disprove Abderhalden's theory of the specificity of ferments.

A. Goss.

Keitler, H., and Lindner, K.: Abderhalden's Dialysis (Über die Abderhaldenschen Dialysiermethode). *Wien klin. Wochenschr.* 1915, xxviii, 549.

The authors first discuss some points in their technique and then take up the results of their work. The chief interest in their work lies in the field of the diagnosis of pregnancy. Among 24 pregnant cases 19 catabolized placenta only. One case gave a negative result with all substrates, one catabolized carcinoma markedly, another only slightly, and in a fourth the serum alone and with albumin, placenta, and carcinoma gave positive results. Among 21 cases of abortion the diagnosis was specific in 11.

In the negative cases microscopic examination did not show any placental tissue capable of functioning. Among 27 cases of carcinoma 15 reacted positively with carcinoma only; the others showed positive reactions also with placenta or other forms of tumor. The reason for these rather unsatisfactory results may be that the authors did not have any metastatic carcinoma of the cervix available for substrates. Among the 21 cases of myoma the reaction was specific in 11. The substrate in these cases was a myofibroma with a moderate content of muscle-fibers. Because of the histological differences in the myomata examined, the results were not uniform in all cases. In one case placenta was catabolized and in another carcinoma. Among 5 cases of hemorrhage in young girls, the ovary was the only substrate digested in 4 cases. Tables

are given showing the results in all these groups and a fifth and sixth table showing results in various gynecological conditions, and with male sera.

The results are not ideal but the failures, such as they are, seem to be due to errors in technique. The Abderhalden reaction is very delicate, so that the interpretation of the results offers some difficulty. The results seem to prove the correctness of the theory, if the details of the test are carried out with sufficient care. Errors may be caused either by the dialyzers or by the substrates. The latter are seldom completely freed of blood. It would be desirable to find some substitute for the ninhydrin reaction. The subjective element should be eliminated as far as possible, for the diagnosis may depend on slight differences in tints. Future work should be devoted to perfecting the reaction and overcoming the sources of error.

A. Goss.

Steiner, H.: Abderhalden's Dialysis (Klinische Studien mit Abderhaldenschen Dialysierverfahren). *Deutsche med. Wchnschr.*, 1915, xli, 489, 526.

Steiner reviews the work of a considerable number of authors and gives tables showing his own results. He concludes that the method has a considerable value in diagnosis, but that its importance may be exaggerated. If menstruation can be excluded, a positive reaction with placenta justifies a diagnosis of pregnancy. A negative result is conclusive as to the absence of pregnancy. The results have just about the same value in diagnosing diseases of the organs of internal secretion. A definite diagnosis should be made, however, only in connection with the clinical symptoms, because in a disease of one organ the serum generally catabolizes several organs; this is due to their close interrelation.

The most favorable field for the use of the reaction is in diseases of the thyroid. The test is not so reliable in liver diseases, for the serum itself in cases of icterus contains substances that react with ninhydrin.

The author has not had sufficient experience with carcinoma to enable him to pass judgment as to its value in this condition. The principle of the reaction seems to be correct, and the clinician should make use of it in diagnosis, but further development in the technique is necessary in order to overcome certain sources of error.

A. Goss.

Otto, R., and Blumenthal, G.: Abderhalden's Dialysis (Erfahrungen mit dem Abderhaldenschen Dialysierverfahren). *Ztschr. f. Immunitätsforsch.*, 1915, xxiv, 12.

The authors described their technique and give in tabulated form the results of their work in several series of cases, including pregnant and non-pregnant women, patients with carcinoma, syphilis, dementia præcox, and various other forms of mental disease. They find that the serum of pregnant women practically always catabolizes placenta. If the reaction is negative it is almost certain that

pregnancy does not exist; but a positive reaction does not speak with equal certainty for pregnancy, because the serum of carcinoma patients in all their cases gave a positive reaction with placenta. There is also a high percentage of positive reactions in syphilis.

The serum of men with dementia præcox gives a positive reaction regularly with testis and often with brain, but it also often gives a positive reaction with placenta. Testicle tissue is also frequently catabolized by the sera of patients with some other forms of mental disease, and also by that of pregnant women; so that, while there is undoubtedly a difference in the reaction in normal people and those with various forms of disease, the authors do not believe in the organic specificity of the ferments as described by Abderhalden. They believe from clinical experience and animal experimentation that there are various ferments in the body that do not have any organic specificity, and the action of the specific ferments may be masked by that of these non-specific substances. They think the Abderhalden reaction is not to be recommended for practice because of this lack of specificity of the ferments and also because of the many sources of error in the reaction itself; in addition to the difficulty in preparing the substrates and keeping the dialyzers in proper condition there are various substances that give a ninhydrin reaction.

A. Goss.

Blumenthal, N.: Theory and Diagnostic Value of the Melostagmin Reaction (Diagnostische Verwertbarkeit und Theorie der Melostagminreaktion). *Ztschr. f. Immunitätsforsch.*, 1915, xxiv, 42.

Blumenthal gives an exhaustive discussion of the theory of the melostagmin reaction, first applied by Ascoli to the differentiation of pathological and normal sera. The surface tension is decreased and therefore the number of drops to the cubic centimeter are increased in the pathological sera as compared with the normal ones. Three theories have been advanced to explain the reaction. It may be due: (1) to chemical changes, such as increase of the lipoids, especially the fatty acids, and decrease in the contents of cholesterol and similar substances; changes in the quantitative and qualitative composition of the albumin, especially albumins and globulins, and their products, peptones and albumoses; (2) to physicochemical changes, such as changes in the concentration of OH and H-ions, and changes in the power of absorbing and combining acids and bases; or (3) to physical changes, such as decrease in the adhesive power of the individual components, which may be produced by pathological conditions, carcinoma, etc., or artificially by heating, shaking, etc. Blumenthal is inclined to believe that the latter theory is the correct one. He found a combination of linoleic and ricinoleic acids much better as an antigen than the tissue extracts first used. It is more stable, more easily prepared, and produces a greater reaction.

The reaction is not increased by the addition of cholin or levithin.

As to its clinical usefulness, he found it valuable in the differential diagnosis of carcinomata of the gastro-intestinal tract, and in the diagnosis of pregnancy in perfectly normal women. It is of only limited value in the diagnosis of carcinoma of the female genital tract, and of no value in carcinoma of the liver or skin. In order to make a positive diagnosis of carcinoma or of pregnancy the following conditions, which also give positive reactions, must be excluded: diabetes mellitus, uræmia, infectious diseases with fever, severe tuberculosis, chronic inflammations of bones and joints, cirrhosis of the liver, and sometimes syphilis and sarcoma.

A bibliography of 122 titles is given, and also tables showing results in a large number of cases.

A. GOSS.

Levin, I., and Van Slyke, D. D.: Results of Applying a Quantitative Method to the Abderhalden Serum Test for Cancer. *J. Am. M. Ass.*, 1915, 57, 245.

The authors used a quantitative method of estimation of the proteolytic activity of a serum by measuring the ammonia nitrogen increase after the serum had acted on the given substrate. Controls were made with serum alone and with serum from normal individuals. A parallel series of experiments was performed using the dialysis method.

The results of the experiments using the two methods did not seem to coincide. In general there was little difference between the reactions obtained from the blood serums of the carcinoma cases from those obtained from the noncancer sera. The authors, therefore, believe that the reaction is of doubtful clinical value and for the present at least the Abderhalden cancer reaction belongs to the research laboratory.

F. H. FALLIS.

BLOOD

Burrer, L.: Notes on the Technique of Transfusion. *Internal J. Surg.*, 1915, 33:503, 299.

The author briefly describes the technique of blood transfusion by means of a syringe and two special cannulae.

The veins in the recipient's and donor's arms are exposed by a 1-cm. incision and the cannulae is inserted and fastened by ligatures. These are kept patent by salt solution and the escape of blood is prevented by compression of the rubber tube attached to each cannula.

The blood is slowly withdrawn from the donor into a "reversal" syringe which is passed to an assistant who gradually injects the blood into the recipient's vein. This is continued until sufficient blood is obtained.

The advantages are:

1. Cannulae are easily inserted and remain in situ.

2. There is no clotting, as large tubes are employed.

3. An inexperienced assistant can be used at the recipient's side to inject the blood.

4. Loss of blood is prevented by the use of a short cannula with rubber coupling.

5. The cannulae will not fall even in inexperienced hands.

PHILLIPS M. CHASE.

Percy, N. M.: A Simplified Method of Blood Transfusion, with Report of Six Cases of Pernicious Anæmia Treated by Massive Blood Transfusion and Splenectomy. *Surg., Gynec. & Obst.*, 1915, 20, 166.

The author reports fifty-four blood transfusions effected by means of a one-piece, paraffin-lined, glass tube holding 650 ccm. of venous blood, protected from contact with air by a floating layer of sterile liquid paraffine. He describes a series of massive blood transfusions applied at intervals of ten days, to cases of severe pernicious anemia, until they were so improved (temporarily) that splenectomy could safely be performed. He reports in detail, one case of three years' duration with evident cure eighteen months after splenectomy, showing a rise in erythrocytes from 868,000 per ccm. to 5,200,000 and a change in the blood picture from a typical pernicious anemia to perfectly normal. He reports 5 additional cases with the same apparent result two months after step-ladder transfusions and splenectomy.

The signs and symptoms of fatal hæmolytic are described, the cardinal signs being: vomiting, respiratory distress, pain low in the back, and a characteristic blush and profuse sweating, followed by pronounced chills and suppression of urine. Death occurred in three weeks.

Percy finds that the tests for hæmolytic *in vitro* and agglutination, as described by Rous and Turner, are not dependable, and he gives a preliminary transfusion of 20 ccm. of blood intravenously, by hypodermic syringe, believing that this amount of blood will indicate hæmolytic phenomena without serious sequelæ.

The advantages of his method are:

1. Known quantities of blood may be administered.

2. As much as 600 ccm. can be given in five to eight minutes.

3. Venous blood is utilized, so that arteries, such as the radial, are not destroyed.

4. Transfusion may be made without contaminating the donor with the blood of the recipient.

5. No air comes in contact with the blood, thus lessening the liability of clotting.

6. There is direct communication between vein and chamber by a simple paraffin-lined glass tube. There are no metal, rubber, or other connections, whose edges cause resistance to the flow of blood.

7. The apparatus is simple and can be made by any good glassblower.

BLOOD AND LYMPH VESSELS

Zahradnický: Treatment of False Aneurisms
(Die Behandlung der unechten Aneurysmen).
Wien. klin. Wchnsch., 1915, xxviii, 999.

The author reviews the literature of aneurisms during the Balkan War and the present war so far as he has been able to obtain it. He gives a table showing the method of operation and the results in 425 cases, and also an extensive bibliography of the subject. These 425 cases were reported by 45 different authors. Ligation was used in 242 of them and 182 were treated by suture of the arteries. Among the 242 treated by ligation, gangrene developed in 28, or 11.5 per cent, and necessitated amputation. Among the 182 cases treated by suture, gangrene made amputation necessary in 7, or 3.7 per cent. The mortality by the two methods was about the same, 7.4 and 7.1 per cent. But the figures show that ligation is followed by gangrene three times as often as suture of the vessels. Still better results could be obtained with suture if the advice were followed of several prominent authors who advocate early operation before adhesions have formed, and when there is not so great a tendency to thrombosis.

Zahradnický also reports 52 cases of aneurism of his own, 49 of which were operated on and 3 recovered spontaneously. Of the operated cases 28 were treated by ligation, 1 by plication of the sac and 20 by suture. Among the 28 cases of ligation there were 6 of gangrene and amputation, or 21.4 per cent, 1 of superficial gangrene and 4 deaths from sepsis, or 14.2 per cent. Among the 20 cases of suture there were 2 of gangrene with amputation, or 14.2 per cent and 2 deaths, or 10 per cent. This confirms the results from the literature, that is, that gangrene is more frequent after ligation than after suture.

Ligation should be reserved for severe cases of sepsis or anæmia, where operation is necessary to save life, or for cases where the collateral circulation is already established and suture is unnecessary. In some cases where a considerable length of vessel must be removed the transplantation of a piece of vein becomes necessary. This is a difficult operation but such satisfactory results have been obtained with it that it is indicated in some cases. Two of the author's cases were treated in this way, one of them being successful and the other followed by gangrene. Lateral suture of the vein is a simple procedure and may be undertaken by any skilled surgeon, but circular suture and vein transplantation should be practiced experimentally on animals. They do not require any special instruments. The strength of the arterial suture is shown by the fact that adhesive plaster extension can be applied to the limb immediately afterward. Two of the author's cases were complicated with fracture of the femur, and he applied extension with a weight of 10 kg., without any bad results.

A. GOSS.

Kahn, A.: Facilitating the Connection of Blood-Vessels. *Internat. J. Surg.*, 1915, xxviii, 315.

Kahn briefly describes the suturing of vessels by means of a divided cannula, devised by himself. The cannula being closed by a screw on the handle, is slipped over one end of the torn vessel which is then cuffed back over the end of the instrument, a ligature holding it in place. The other end of the vessel is then looped over this cuff and secured by another ligature, the first ligature then being cut. All clamps on the vessel are removed, the circulation resumed, and the two divided ends are directly sutured. The second ligature is severed and the cannula removed from the vessel by spreading in two parts, leaving a reunited blood-channel.

PHILLIPS M. CHASE.

SURGICAL THERAPEUTICS

Andreas, E.: The Effect of Some Uterine Tonics on the Circulation, Especially the Lesser Circulation (Über die Wirkung einiger Uterus-tonika auf die Zirkulation mit spezieller Berücksichtigung des kleinen Kreislaufes). *Arch. f. Gynäk.*, 1915, civ, 105.

The following chemically pure bodies can be isolated from ergot: (1) the alkaloid ergotin and (2) the amins, β -oxyphenylethylamine, β -imidazolethylamine, iso-amylamine, and phenylethylamine. Some of these are sold in trade as substitutes for ergot, either alone or in combination. The author tested the effect of these preparations on the circulation, especially the lesser circulation. He found that when ergotoxin is injected intravenously it does not cause a pronounced rise in blood-pressure, as the English authors Barger and Dale found, but a slight fall. He explains the difference by the fact that the Englishmen worked with animals that had had their brains removed, while the nervous system of his animals was intact. There was no change in the lesser circulation with small doses, while with large doses there was a slight vasoconstriction, which is the primary effect of the ergotoxin on the vasoconstrictors of the vessels of the lungs.

β -oxyphenylethylamine causes a slow and constant rise in blood-pressure, while the pressure in the pulmonary rises at the same time. The pulse becomes slower. β -imidazolethylamine has a very stimulating effect on the smooth muscles, but it is decidedly toxic. The blood-pressure sinks markedly and there is a diminution of the heart's force. In about 10 to 15 seconds after the intravenous injection there is a rapid and decided fall in the pressure in the pulmonary and a rapid fall in the plethysmogram. This effect is to be attributed to the vasoconstrictors of the vessels of the lungs. The bronchial pressure is not changed, so it does not have the effect of constricting the bronchioles. Iso-amylamine and phenylethylamine have practically no effect on the blood-pressure.

From the different effects of these substances it can be seen that the effect of preparations of ergot

must be very complex. In general immediately after injection there is a slight rise in blood pressure, followed by a greater fall, and a secondary rise in the pulmonary, with a slight decrease in the pulse-count. The fall in blood pressure is to be attributed to the β -imidazoethylamine, the slowing of the pulse to the other amines.

The chemically pure synthetic ergot preparations should be so compounded that the total effect does not produce either a pronounced fall or a pronounced rise in the blood pressure. Heretofore, in making the preparations no attention has been paid to their effect on the lesser circulation. The author found that ergotin caused a slight rise in the pulmonary while the plethysmogram also showed a slight rise. Tremor corresponds to the combined effect of β -imidazoethylamine and β -oxyphenylethylamine, of which it consists. There is no change in the carotid curve, while the pressure in the pulmonary rises.

Adrenalin causes a rise in the pulmonary pressure and an increase in the variations and the volume of the plethysmogram of the lungs, caused chiefly by an increased flow to the right heart; that is, it is secondary. There is no reason to assume a specific effect on the vessels of the lungs. Pituitrin increases the blood-pressure and has no effect on the lesser circulation.

The toxic properties of β -imidazoethylamine make it necessary to exercise great caution in its use. Though tremor does not produce any dangerous symptoms, it should be used cautiously because of the effect it produces on the lesser circulation, for there are some individuals who are especially sensitive to β -imidazoethylamine. From the point of view discussed ergotin seems to be a very good ergot preparation. After the administration of ergot, adrenalin should not be given, but extract of hypophysis and β -oxyphenylethylamine may be given. A. Goss.

Dakin, H. D.: Use of Certain Antiseptic Substances in the Treatment of Infected Wounds (Au sujet de l'emploi de certaines substances antiseptiques dans le traitement des plaies infectées). *Presse med.*, 1915, XLIII, 177.

Dakin points out the disadvantages of various antiseptics in common use, including phenol, bichloride of mercury, iodine, nitrate of silver, etc. Sodium hypochlorite has a high germicidal power and other useful properties, but as obtained in commerce it contains free alkali, which has a very irritant action on the tissues. He has found that it can be rendered neutral by the addition of boric acid, thus preserving its high antiseptic property and overcoming its irritant properties.

The solution can be simply prepared as follows: 140 gm. of dry sodium carbonate, or 400 gm. of the crystallized salt, are dissolved in 10 liters of water, and 100 gm. of calcium chloride of good quality are added. The mixture is shaken and at the end of half an hour the clear liquid is siphoned off from

the precipitated calcium carbonate and filtered through cotton. Forty grams of boric acid is then added to the liquid and the solution is ready for use. It is important to add the boric acid after filtration, not before. The solution will not keep more than a week.

The best results are obtained by continuous irrigation of the wound with the solution, the results of course being better if treatment is begun early. The solution aids in the dissolution of necrotic tissue and has a slight haemostatic action. There is no irritant action at all, and experience with it for six months has demonstrated its value. A. Goss.

Carrel, A., Dakin, Daufresne, Dehelly, and Dumas. Abortive Treatment of Infection in Wounds (Traitement abortif de l'infection des plaies). *Presse med.*, 1915, XLIII, 197.

Tuffier has found that about 800 out of 1,000 amputations are not done on account of the gravity of the wound, but for the infection that follows it. This shows the great importance of preventing infection; prevention or abortion of infection is of infinitely more importance than treatment of its results, suppuration, septicaemia, and gangrene. Examination of the discharge from a wound five or six hours after it is made and again 24 hours later, show how much simpler early treatment is than later.

One point in abortive treatment of wounds is the early removal of foreign bodies. The wound should then be sterilized with some antiseptic that is strongly germicidal, not irritating to the tissues, and that is so applied as to penetrate all the recesses of the wound. After a comparative study of various antiseptics the authors have selected as the most effective and least irritating sodium hypochlorite prepared by Dakin's method. After the wound has been thoroughly cleansed, foreign bodies and bits of bone removed gently with the fingers or forceps, and bleeding controlled, a loose dressing is applied, no impermeable substance ever being used. Rubber tubes are run down into all recesses of the wound and project out through the dressings. Dakin's fluid is poured into them every hour at first and less frequently later. Continuous irrigation is even better if possible. This fluid can be applied for days or even weeks without irritating the tissues. It should not be used with alcohol and should not be heated.

Needless to say it is of great importance that the ambulance service should be so organized that the wounded would be brought in for treatment as quickly as possible. Examination of a series of wounds at different stages should show rapid decrease of the bacterial count under this treatment. A. Goss.

Bürgi, E.: Magnesium as a Treatment for Tetanus and as a Narcotic (Das Magnesium als Mittel gegen Tetanus und als Narkotikum). *Jakobst. f. anal. Forsch.*, 1915, VI, 1.

Bürgi gives an exhaustive discussion of the pharmacological properties of magnesium sulphate

and a bibliography of the literature on the subject. Animal experimentation has not shown definitely that this substance is a true narcotic, but clinical results show that it is. Painful ulcers are rendered painless by the local application of magnesium sulphate, and when it is given subcutaneously, intramuscularly, intravenously, or intraspinaly it causes cessation of pain and loss of consciousness.

The chief clinical use of magnesium as a narcotic has been in the treatment of tetanus. Kocher reports excellent results in adults, but poor ones in children. He gives a 15 per cent solution intraspinaly. The only danger than he can see is that of paralyzing the respiratory center, and this may be combated by the administration of calcium chloride, calcium being an antagonist of magnesium; by keeping the patient in the proper position and by the insufflation of air or oxygen into the bronchi. He recommends a repetition of the injection whenever convulsions begin again. The effect lasts 8 to 24 hours longer with the intraspinal method of injection than with any other and if sufficient care is taken there is little danger of injuring the respiratory center. Kocher gives an adult 10 ccm. of the 15 per cent solution, while Meltzer and Auer recommend 3 to 5 ccm. of a 25 per cent solution. This dosage may be repeated twice in 24 hours. Given oftener than that it may produce harmful cumulative effects.

Straub prefers intravenous administration. He found that the muscles that were in convulsions were paralyzed quicker than the normal ones, and that they were not completely paralyzed, but only reduced to normal activity.

Stadler has given a series of statistics showing the marked reduction in mortality after magnesium sulphate treatment, but Bürgi does not think these statistics are valid, because they do not extend over a large enough number of cases. He is convinced, however, that the magnesium treatment is effective. It not only prolongs life but may save it, for one of the causes of death is exhaustion from the repeated convulsions. Further work needs to be done in regard to the comparative value of the different methods of administration.

A. Goss.

ELECTROLOGY

Levin, I.: The Efficiency of the Coolidge Tube, and the Rationale of Radiotherapy in the Treatment of Malignant Tumors. *Surg., Gynec. & Obst.*, 1915, xxi, 374.

The author reports on an experimental study of the relative efficiency of the biological action of the röntgen rays emitted by the Coolidge and the old-type tubes. The results of experiments in radiation of pieces of meat of various thicknesses show that one-half of the quantity of the rays emitted by a Coolidge tube penetrate to the depth of 3 inches, while only one-third of the rays emitted by an old-type tube penetrates to the same depth. To the depth of 4 inches one-seventh of the rays

penetrate from an old-type tube and one-fifth of the rays from a Coolidge tube. This greater efficiency of the Coolidge tube for purposes of therapy is due to the greater uniformity of the röntgen rays emitted by a Coolidge tube and a smaller admixture of soft non-penetrating rays.

The author reports 41 cases of deep-seated malignant tumors treated during the last eighteen months with the modern methods of radium and röntgen therapy. Of these cases, 13 died, 11 discontinued treatment, 14 remained unimproved, and 3, or 7.5 per cent of all the cases treated, are at present clinically cured.

A complete clinical and gross and microscopical post-mortem study is reported of a case of an inoperable carcinoma of the sigmoid with a carcinomatous dissemination in the peritoneal cavity, which died over a month after the beginning of röntgen treatment. The study of this case shows the following points of importance: notwithstanding the continuously very large doses of röntgen rays, there was no injury to the organism. At the same time the majority of the islands of tumor-cells in the peritoneal nodules were either completely destroyed and replaced by dense fibrous connective tissue or were surrounded by the connective tissue and inhibited greatly in their growth. The original sigmoid tumors did not increase in size during the time of treatment.

The author further compares his results with the reports of other clinicians. The analysis of 1,002 cases of deep-seated inoperable malignant tumors shows that 6.7 per cent of these cases were clinically cured. The author concludes that the therapeutic action of the actinic rays is not entirely local. The rays may destroy cancer-cells at a considerable distance from the source of the rays; but the farther the distance of the tumor from the surface of the body, the smaller its size must be in order to be destroyed by the rays.

MILITARY SURGERY

Leriche, R.: Non-penetrating Injuries of the Skull by the Bursting of Shells, and the Nervous Lesions Caused by Them (Des petites plaies du crâne par éclats d'obus et de bombes sans pénétration du projectile et des lésions nerveuses qui les accompagnent). *Lyon chir.*, 1915, xii, 293.

Leriche gives an extensive study of the subject, reporting the details of 87 cases of skull injury and 11 others in which there was no direct wound but only severe concussion of the brain or spinal cord from explosion of shells or mines. He has seen 397 cases in which the fragment of shell had apparently only bruised the scalp. But no matter how slight the wound appears to be an exploratory incision should be made in every case, and if the bone looks at all abnormal it should be trephined; but if the dura is found intact it should never be incised, no matter how severe the subjacent hematoma and confusion of the brain may be. High pressure in the spinal

fluid does not distinguish between deep-seated and superficial lesions. Tardieu was inclined to believe that it did at first, but has tested it thoroughly and found that it did not. High pressure and an abnormal tint of the fluid indicate the existence of small foci of contusion of the brain, due to air concussion from the explosion of the shell, rather than to the effect of the projectile itself. Lumbar puncture is of great value in treatment.

In the cases caused by concussion the pressure of the spinal fluid remains high for days if puncture is not performed, and the patients show paralytic phenomena or melancholia with stupor or Jacksonian epilepsy. Odema of the brain and hemorrhagic foci were found on trephining, and lumbar puncture gave great relief.

A. Goss.

Tartois: Thirty-four Penetrating Wounds of the Abdomen Treated at the Front (*Trente-quatre plaies pénétrantes de l'abdomen traitées dans une ambulance divisionnaire du front*). *Bull. et mém. Soc. de chir. de Par.*, 1915, 33, 1937.

Tartois gives the clinical histories of his cases, and divides them into three series. Of 8 treated conservatively, all died, or 13 treated by suprapubic incision and drainage, only 3 recovered, or 26 per cent. He then decided to perform laparotomy and give thorough surgical treatment. Of 11 cases treated in this way 3 recovered, or 45 per cent. As these operations were performed by the same surgeon and under similar conditions they offer conclusive evidence of the superiority of surgical treatment.

Tartois was in an improvised hospital very near the firing line, where he was "surgeon, interne, externe, and nurse," and besides the multiplicity of his duties his equipment was very incomplete. This situation, however, had one advantage that he got his patients very soon after they were wounded; the operations were performed not more than eight hours after injury. In the Balkan War he was in the Turkish Red Cross service, and at that time he believed in the conservative treatment of abdominal injuries, but this later experience has convinced him of the superiority of surgical treatment, even when it has to be performed under quite unfavorable conditions.

A. Goss.

Enderlen and Sauerbruch: Operative Treatment of Abdominal Wounds in War. *Med. Klin. Berl.*, 1915, 11, No. 30.

The authors recommend prompt operative interference in abdominal wounds involving the gastrointestinal tract. They treated 217 soldiers for gunshot of the abdomen. They operated on 211; of these 92.9 per cent exhibited gastro-intestinal perforation, in 4.8 per cent there was no intestinal nor visceral lesion, while 2.3 per cent suffered severe injury to the liver. Operative treatment cured 44.4 per cent of the 211 operated upon. Of the 5 cases sustaining injury to the liver, 3 or 60 per cent recovered under operation.

Experience in abdominal work enabled the authors to give accurate diagnoses so that the later groups of cases showed better results from earlier operative interference. Transport facilities have improved with the progress of the war so that the injured are now brought to field hospitals in from two to four hours from the time of injury. Direct transfusion of blood is no longer recommended. Infusion by the drop method has given good results.

As in the preference of the lying or sitting posture in convalescence, the latter was practiced by Enderlen and the former by Sauerbruch, with no material difference in the outcome. The value of heat applied to the abdomen in post-operative cases was proved by both authors. Early feeding was practiced in all operated cases, and quiet after operation was insisted upon.

Concerning the difficulty of determining abdominal perforation early, the authors call attention to costal respiration which they consider of the greatest importance in determining the presence of intestinal lesion. Prompt operation is called for when the surgeon has reason to believe that hemorrhage is taking place.

LOUIS A. LAGARDE.

Horn: Treatment of Fractures of the Femur in the Field (*Beitrag zur Behandlung der Oberschenkelbrüche im Felde*). *Ztschr. f. Arz. Fortbild.*, 1915, 10, 400.

It has been the almost universal custom to dress all fractures in the field with plaster casts, because it has been thought impossible to transport them in adhesive plaster extension. Horn thinks it is quite right to apply the plaster cast in cases where the fractured ends can be brought into proper position, where the condition of the wound is such that it can be dressed through a fenestrated cast, and where there is no extensive infectious process and danger of secondary bleeding. But if the displacement is so great that correct replacement is difficult or impossible, if the wound is severely infected, or if plaster is not available, as sometimes happens, adhesive plaster extension can be applied to fractures and they can be thus safely transported. He himself has attended to the transportation of a number of cases and they have arrived at the base hospital in good condition without pain or displacement of the fractured bones. He describes a stretcher designed for this purpose, provided with an extension apparatus, which folds up so that it is no larger than an ordinary stretcher.

A. Goss.

Leva, J.: Injuries of the Spinal Cord in War (*Über Verletzungen des Rückenmarks im Kriege*). *München. med. Wochenschr.*, 1915, 131, 925.

In 9 of the cases observed by Leva, symptoms of complete transverse lesion predominated; in 5 there were signs of a lesion of one half of the cord, and in 7 signs that indicated solitary injuries of different centers. Of the patients with signs of a total transverse lesion 2 died soon after they were received, 1 of an ascending meningitis and 1 of pyelonephritis,

the condition of 1 remained unchanged, in 1 the symptoms gradually improved till they were those of a unilateral lesion, in 2 a spastic paralysis developed, and 3 improved so much that no organic symptoms remained except increased reflexes.

These cases show that symptoms of a complete transverse lesion at first do not by any means prove that there is actually a complete severing of the cord. Shock and concussion have caused a temporary cessation of its function, which is restored in time.

Of the 5 patients with unilateral symptoms 2 improved markedly, while the paralysis only improved slightly in the other 2. In the other cases the course varied, in 1 it was very favorable, 2 developed cerebellar symptoms, 1 developed pain and atrophy of the right arm, which did not improve much even after laminectomy. In 2 cases of injury of the neck signs of lesion of the medulla developed, including various subjective symptoms and paresthesias. Injuries of the cervical column did not produce such serious effects as injuries lower down. The total of 21 cases after six months' observation shows 2 deaths, or 9.5 per cent, but they cannot be regarded as closed, for secondary signs of degeneration often appear a long time after the injury. A. Goss.

Baumel, J.: Lumbar Puncture in Nervous Shock and Wounds of the Skull in War (*La ponction lombaire dans les commotions nerveuses et les traumatismes du crâne par projectiles de guerre*). *Lyon chir.*, 1915, xii, 271.

Baumel has had occasion to examine the cerebrospinal fluid in a large number of cases during the war and he gives a table showing in detail the results in 56 cases. The condition of the spinal fluid gives important information as to the extent and severity of the injury. It is also of considerable value in treatment, for he finds that the pressure of the spinal fluid is above normal, even in cases of mere concussion where the projectiles have not come into direct contact with the skull. Nearly all the wounds reported were from fragments of shells.

If the spinal fluid shows an increase in the polynuclear count it means a more serious prognosis, for polynucleosis is an index of infection. When there is only lymphocytosis, the meningitis is subacute. Lumbar puncture is the only rational form of treatment in simple disturbance of the nervous system and in non-penetrating wounds of the skull. It is valuable also in cases of severe injury of the skull as it reduces the symptoms caused by high pressure, rids the system of toxins, and hastens recovery. It should be performed systematically day after day as long as it is doing good, for it is absolutely harmless. A. Goss.

Stargardt, K., and Kirschener: English Bullet Wounds; Some Remarks on the Action of the Regular Infantry Bullet and the Dumdum Bullet. *J. Roy. Army M. Corps*, 1915, June, 601.

Stargardt confines himself to the appearance of the wounds caused by the English infantry bullet

and some wounds inflicted by the French infantry bullets, all coming from the western front. The two groups of wounded showed a striking difference in both their clinical and characteristic features. The wounds inflicted by the French infantry bullet were not as a rule very severe and were generally attended by a favorable prognosis.

The wounds caused by the English infantry bullet were generally more severe; bones were more fragmented, the vessels and nerves more frequently hit, muscles much more extensively torn, than was the case when wounds were inflicted with the French infantry bullet. The severe bone lesions from the English bullet often exhibited extensive wounds of exit, which were at times erroneously thought to be the result of wounds inflicted by dumdum bullets. These large exit wounds were often seen in similar injuries by the French bullet when the latter had turned in the body.

The X-ray pictures of bone injuries by the English bullet exhibit a greater area in the wounded part with many fragments of metal, so much so, that the lesion resembles that of lead fragments from shrapnel balls. In cutting down upon this area, however, fragments of the infantry bullet were almost invariably identified. The greatest significance was attached to the fact that the broken up bullet contained two distinct cores. A dissection of the English bullet showed that the core was made up of two different metals, the forward core measuring 11 millimeters in length composed of a lighter aluminum metal, and a rear core 20 millimeters in length composed of the heavier lead metal, separated from the forward core by a narrow line of demarkation. Stargardt is fully convinced that the special construction of this bullet exercises an explosive action on striking resistant structures, since it disintegrates more easily at the moment of impact than the normal bullet which is filled with a hard lead core. He claims further that he has not in a single case extracted a lodged ball from the English infantry rifle that was not deformed. He makes the accusation boldly that the English infantry bullet is manufactured with the idea of wounding and mutilating the enemy which it may strike. Outwardly the bullet is harmless looking, showing none of the marring effects that are practiced on the steel coating to promote deformation and thereby convert it into a dumdum bullet. He makes the claim, however, that in some cases the point of the bullet has been broken off by the enemy before firing by placing the point in a vice which is provided in the stock of the English rifle, but he maintains that this marring of the bullet is not necessary since the bullet with the point intact will exercise an explosive effect on striking.

Kirschener's remarks on the action of the regular infantry bullet and the dumdum bullet deal with the construction of the bullets, the action of the regular infantry bullets, the occasional abnormalities of the shape and position of the regular bullet, the action of the regular infantry bullet when its

position and shape have been altered, and the action of the dum dum bullet.

The construction of bullets is discussed under two heads: the steel mantle bullets filled with a core of lead or lighter metal, and the solid bullets made of one material. The mantle bullets are those used by all the armies engaged in the present European War, except the French, who use a bullet made of a solid mass of bronze (90 per cent copper).

The dum dum bullet is described as a modification of the mantle bullet in which the steel coating is incomplete at the front end so that the lead core is exposed to view. This is usually accomplished by breaking off the point in a vice, filing or sawing down to or through the lead core thus inviting the tendency to fragmentation on impact against hard bone. The marred jacket of the bullet is at times smoothed over by filling the gap with a metal, like aluminum, so that the character of the bullet is not apparent on inspection. This is the device sometimes resorted to in factories that make ammunition for sporting purposes. A soldier, if he so chooses, can convert a regular steel-clad bullet into a dum dum projectile by the use of a file, saw, gimlet, etc., in a few minutes. This is not possible with the French bullet which is made of one solid piece of metal.

The action of the regular infantry bullet on regular impact through soft tissues and spongy bone is to inflict a cylindrical channel about the size of its own diameter, with correspondingly small wounds of entrance and exit in the skin. If the remaining velocity of the bullet is great and the bullet encounters hard bone, the latter is very much shattered and the amount of shattering effect is inversely proportional to the distance traveled by the bullet. The shattering effects within 400 meters by all the normal steel-mantled bullets are so great that the area of fracture is said to possess the appearance created by an explosion at the point of impact—splinters of bone varying in size are detached and scattered broadcast in the neighboring tissues. At very close range gaps occur in the continuity of the bone, one and two inches in length. The soft tissues are very much lacerated, and hematomata fill the channels made by the spicule of bone which are lodged in different directions. The point of exit is often marked by a large wound measuring several inches in diameter, whilst the wound of entry is small. When the projectile strikes a part of the body enclosed by a rigid wall containing a fluid or semifluid mass like the skull, the explosive effects in the proximal ranges are enormous. Organs like the stomach, the intestines, bladder, and other viscera containing fluids are very much lacerated by shots at close range.

In discussing the occasional abnormalities of the shape and position of the regular bullet the author points out the well-known fact that the center of gravity of the infantry bullet is well disposed toward its base, since it tapers from near the base to the point. This is specially true of the spitzer bullet first adopted by the German army. The bullet is

thereby made unsteady in flight with a tendency to rotate on its short axis. This altered position to the line of flight may cause the bullet to strike the body side or base on or in an intermediate position. The altered position of the bullet may be exaggerated in ricochet and when the article which it strikes is resistant, like a rock or piece of metal, the shape of the bullet may thus be materially altered.

The turning of the bullet in the latter end of its trajectory is common, so that lodged balls in wounds inflicted in the remote ranges are usually found to be butt-end to.

When the regular infantry bullet has changed its position or shape in the ways mentioned the characteristic features of the wound vary from those of the normally shaped bullet when it makes a regular impact. Thus, a bullet striking side-on will cause greater laceration of soft tissues and fragmentation of bone, and the same is true when the bullet has suffered deformation from any cause. In addition, a bullet which strikes a resistant bone side-on when traveling at great velocity is apt to disintegrate by first losing some of the lead core which is exposed at the base. This disintegration will of course be more commonly seen in bullets that have primarily been altered in shape by ricochet. The appearance of the wounds thus caused are so much like those inflicted by a dum dum bullet that it is difficult if not impossible to distinguish between the two. The French bullet is not so easily distorted in ricochet or on striking hard bone, nor does it disintegrate and lacerate tissues by the escape of a metal core since it is made up of one solid piece of metal.

In describing the action of the dum dum bullet the well-known fact that it does not disintegrate while traversing soft tissues only is especially emphasized. In order that the dum dum bullet shall break up in the way that it is designed to do, it must collide while traveling at a fair rate of velocity against resistant bone, otherwise its effects are very similar to a full jacketed or old time lead bullet.

In summing up his conclusions Kirschner maintains that conclusive evidence that a wound has been inflicted by a dum dum bullet is the recovery of the projectile in its original shape or slightly deformed. Extensive destruction of the tissues affords no proof of the use of a dum dum bullet, since like lesions are common with the normal bullet striking sideways and also when the shot is delivered at short range against resistant structures like the skull, the diaphyses, and organs filled with fluid or semifluid masses, like the stomach, the intestines, and urinary bladder. The fact that pieces of the steel casing and the lead core are found in the area of fracture is no evidence of the use of a dum dum bullet, since this occurrence is often noted from the use of the steel-mantle projectile. Such breaking up of a normal bullet applies to the infantry rifle ammunition of all the armies except the French. The latter cannot be transformed into a dum dum bullet as already noted.

In commenting upon the papers of Stargardt and Kirschener, PILCHER notes that the Germans were the first to adopt the pointed or spitze bullet. That this very unstable bullet would inflict wounds having the character of those from dum dum bullets was early pointed out by the German military surgeons after experiments on cadavers and living animals, and this fact is daily corroborated by the English surgeons in their treatment of war wounds.

With the use of the ogival-headed, bullet of the reduced caliber rifle of 6 to 8 millimeters which preceded the use of the spitze bullet, there was a loss of wounding power in soft parts, epiphyseal ends of bones, and the diaphyses at certain ranges. This loss of wounding power was due to the small striking area of the bullet. To increase the wounding power it was necessary to resort to the use of expanding or dum dum bullets, which as everybody knows are ruled out in civilized warfare by international agreement, but Pilcher maintains that the Germans who invented the pointed bullet achieved the same end by adding instability to the military bullet, which gives it in effect all the characteristics of a dum dum bullet in the creation of wounds. To make a long story short, he dismisses the unfair charge made against the English for the use of the lighter metal of the core near the tip of their bullet by the following explanation: "The device in construction of the bullet with two cores renders the tip of the English bullet considerably lighter than the cylindrical part farther back, and consequently the center of gravity of the whole bullet is thrown nearer the base than is found in the lead core bullet of the Germans. This fact makes the tendency to turn on impact considerably more marked than if the whole core were of one metal." In his opinion there is no appreciable difference in severity between the wounds inflicted by the German and English bullets. They are equally severe and it is quite apparent that we have gone back to the exaggerated type of wounds inflicted at short ranges by the large leaden bullets of the "Brown Bess days," and they occur at vastly increased ranges and therefore in greater numbers, and he adds further that "the nation which first introduced the pointed bullet is responsible for thus turning the flank of an international agreement, as it is obvious that its example must necessarily and in self-defense be followed by all the other nations."

The reviewer of the foregoing controversy desires to make the following comment in justice to all concerned:

1. The Germans, as we understand it, did not designedly adopt the pointed bullet for the purpose of inflicting unnecessarily cruel wounds. All the nations that have adopted this bullet—Germany, England, the United States, Turkey, and France—did so because the pointed missile offers less resistance to the air which enables it to travel longer in a straight line than the round-nose bullets.

This fact has added very much to the continuous danger space, and for that reason tacticians have favored it to the exclusion of other projectiles. The projectile used by the United States Army, which is very much like the German bullet, has a continuous danger space of 718 yards for the ogival-headed bullet of the Krag-Jorgenson and Mauser rifle bullets.

2. In the same way it is unfair to accuse the English of using a double core to add to the severity of wounds. The change in their ammunition was the result of experiments which they made in an endeavor to lengthen their bullet so as to give it more bearing surface in the barrel and thereby make it more steady in flight. By lengthening the bullet with the lead core they added weight to their ammunition, which is very objectionable to tacticians in these days of rapid-fire guns. In order to overcome this objection in their longer bullet they substituted aluminum for the lead tip of the core. It is doubtful if this bullet more readily undergoes deformation than bullets having single lead cores. It is barely possible that the existing separation of the two cores in the English bullet favors fragment more readily when striking resistant structures at high velocity. The increased amount of fragmentation can only be a shade in difference and when we consider that the instability of the two bullets is equally objectionable, we see but few reasons if any for accusations and recriminations.

3. In spite of the fact that pointed bullets are unsteady and prone to make irregular impact, from a number of causes, and thereby increase the severity of wounds, the fact nevertheless remains, that a large percentage of wounded go back to the colors in an incredibly short space of time. Furthermore, we are told that the ratio of killed to wounded is variously stated to be as one to five and as much as one to ten. A recent report from Germany declares that 90 per cent of the wounded are returned to the colors. The character of the wounds and the ratio of killed to wounded largely depend on the armament used and the kind of fighting. Battles in the open with a preponderating rate of military rifle fire at the usual battle ranges would give a majority of light wounds with a less number of killed to wounded; whereas trench fighting at close range with hand grenades, machine guns, and shrapnel would add to the percentage of casualties for the number of troops engaged, and add to the number of killed to wounded. In a recent letter Sir William Osler states that in the first ten months of the war sixty per cent of the British wounded were restored to duty.

L. A. LA GARDE

Tuffier: Early Disinfection of War Injuries (*De la désinfection précoce des plaies de guerre*). *Bull. Acad. de méd., Par., 1915, lxxiv, 314*

The importance of early disinfection of wounds is not sufficiently realized. Of 1,000 amputations

75 per cent were due to the long duration of the treatment of wounds and their late complications, such as neuritis, osteitis, and vicious scars. Disinfection after the first 48 hours is practically impossible, but disinfection within the first few hours is very effective.

The number of bacteria in a wound and their diffusion through the tissues are in proportion to the length of time that has passed since the wound was made. As early as the Russo-Turkish war of 1877, Reyher showed that in injury of the joint there was a mortality of only 15 per cent in the cases treated during the first 12 hours, while among those treated later the mortality was 61.5 per cent. The same thing was true of compound fractures, the mortality rising after the first twelve hours from 18.1 to 22.3 per cent.

The action of the antiseptics in use at present has been shown to be unsatisfactory. From his recent research work Wright thinks that hypertonic salt solution is the best, because of its osmotic action on certain elements of the serum, but it is powerless against the streptococcus. Tuffier believes that the best antiseptic to use is hypochlorite of soda prepared by Dakin's method.

All wounds should be disinfected at the dressing station or at the stationary ambulances, which are from 5 to 30 kilometers back from the firing line. At the dressing stations the skin is disinfected with ordinary petroleum, the superficial or easily accessible parts of the wound cleansed, and a compress of Dakin's solution applied and bandaged loosely. The wounded limb is immobilized. The line of stationary ambulances should form a barrier beyond which no infected case should be allowed to pass. The wounded should arrive there within 12 hours after being wounded, and the wounds be completely disinfected. It is very dangerous to send an infected case farther, and perfectly safe to send the patient on after immobilization and complete disinfection of the wound.

The technique is as follows: Combat shock, though so easily satisfactory means is yet known for doing this. Take a radiogram to show the site of projectiles and the nature of fractures. Give ether anesthesia if there is no contra-indication. Cleanse the skin and apply tincture of iodine, protecting the wound. The wound is then irrigated thoroughly with hypochlorite of soda, and the surgeon explores it very carefully with his finger or a probe; all foreign bodies and bone fragments are removed very carefully so as not to injure sound tissue. Any necessary incisions are made with care and only necrotic tissue removed. After the wound has been cleansed in this way several rubber tubes are inserted into its deepest recesses. If it is necessary in order to hold the wound open tampons of cotton wet with Dakin's solution are put in around the tubes. Sterile cotton is put all around the wound and the limb and very loosely bandaged, the rubber tubes projecting out through all the dressings. Every hour 5 to 10 cc. of Dakin's fluid

is poured into the tubes. The cotton is changed every day. A clear liquid is discharged from the wound at first, but there is no odor or suppuration. The temperature generally falls to normal within 48 hours. Tuffier intends to publish the statistics of his cases treated in this way soon. When the temperature has been normal for a few days and the wound is in perfect condition it is allowed to close up. A. Goss.

Mixter, W. J.: *Surgical Experiences in France.*
Boston M. & S. J., 1915, *clin.*, 411.

A general description is given of Mrs. Whitney's hospital at Juilly, France, its equipment, the work handled, and the usual methods pursued.

The hospital, furnished and maintained by Mrs. Harry Payne Whitney, is located in one wing of an old Jesuit college at Juilly, which is about thirty miles from Paris towards Soissons, and thirty-five miles from the trenches. Compiègne is its distributing-point. Under the direction of Dr. Edward Martin the building has become a modern fully equipped hospital.

French wounded in the trenches receive first aid attention by the medical officer, and are carried back, when possible, to the dressing station. There the dressing is re-adjusted and the diagnosis tag attached. From there, they are sent to one of the first line hospitals or to the distributing-point, as seems advisable. There they are assigned to some local hospital or sent to Paris or southern France. Cases of penetrating wounds of the head, chest, or abdomen are kept near the front until able to travel, but most fractures and some of these serious cases are sent back from the first line hospitals.

The cases at Juilly are bullet fractures and severe wounds not involving the body cavities. Most of the wounds are due to shell or shrapnel, with about 15 per cent due to rifle balls and hand grenades.

The first class usually becomes septic, due to bits of clothing carried into tissues, hence the clothing of such is examined when possible. All cases are X-rayed or fluoroscoped. A moderate number show clinically the presence of gas bacillus, and Mixter believes 90 per cent of all this class of cases will show this bacillus, but in varying degrees of virulence. The suggestion of Hervey as to graded doses of direct sunlight has been used with decided benefit.

In fractures, especially of the femur, the Steinman pin was found most useful. No bone-planting was done. Traction was put on and fracture let alone unless sepsis developed, when the abscess was opened and drained.

Fractures of the long bones by rifle bullets usually remained clean. Fracture of humerus was painted on exit and entrance wounds and the cases treated as closed fractures. Retained rifle bullets were rarely removed, but large fragments of shell and shrapnel usually had to be taken out.

Wounds of the knee-joint were most common, and when septic almost always led to permanent dis-

ability or even death. Slight traction was used in all cases to alleviate the pain, and Carrel's suction drainage recommended.

The judgment of the French surgeons, both as to diagnosis and prognosis, is highly commended by the author.

PHILIPPS M. CHASE.

Alder, A.: Hospital Experience in the Turko-Bulgarian War (*Etappenspitallerfahrungen in türkisch-bulgarischer Krieg*). *Deutsche Ztschr. f. Chir.*, 1915, cxxxiii, 499.

Alder accompanied the Swiss Red Cross to Bulgaria during the Turko-Bulgarian war of 1913. He was stationed at Dimotika, south of Adrianople, where the courthouse had been converted into a hospital. The difficulties of the work were due chiefly to poor hygienic and sanitary conditions, the national peculiarities of the Bulgarians, and other conditions of general, rather than surgical interest. The bacteriological laboratory was established in a vacated Turkish harem, and many of the windows of the hospital were broken out, so that at night several centimeters of snow collected on the bed covers. As to the purely surgical side of the

work he compares his experience with that of Brun, his chief, who is now head surgeon of a hospital in Strassburg.

It seems that there were much better results in the healing of wounds among the Bulgarians than among the French and German soldiers in Strassburg. Osteomyelitis, particularly, has been a much more frequent and severe complication of gunshot wounds among the latter than it was in the Bulgarian war, which leads Alder to question whether the western Europeans are less resistant to disease than their less cultured neighbors on the east. He had a total of 1,363 cases and a mortality of 10, or 0.7 per cent.

He thinks the soldiers' packets of dressings should contain some kind of adhesive plaster. In everyday life in Bulgaria tobacco is used as a hæmostatic, so it was often used during the war. He never punctures in case of hæmothorax. He advises against operation in abdominal injuries. The man wounded in war is much less resistant for the first few days than one wounded in peace. There is such a thing as "war shock," and operations should be delayed 12 to 24 hours.

A. Goss.

EXPERIENCES OF GERMAN MILITARY SURGEONS

INJURIES TO THE SPINAL CORD

Michaelis, at a meeting of the *Verein für wissenschaftliche Heilkunde* of Königsberg,¹ reported the case of a patient wounded by a bullet, which inflicted a small wound of entry in the back of the neck, somewhat to the left of the middle line, and at the level of the fourth cervical vertebra. There was no wound of exit, though the lower jaw on the left side was badly shattered. A day after the infliction of the wound both arms and legs were paralyzed, but there was no paralysis of the bladder. The paralysis of the right arm and leg soon began to disappear, leaving only a slight weakness of the right arm. A skiagram showed slight injury to the fourth cervical vertebra at the junction of its body with its arch. Viewed from in front, the bullet could be seen lying behind the much shattered horizontal ramus of the left lower jaw. No active treatment was attempted during the first fortnight as it was hoped that the paralysis of the left arm and leg would disappear spontaneously. Treatment of the fractured vertebra by Glisson's extension apparatus was impracticable owing to the fracture of the jaw. The fragments were united by bronze wires, and the bullet was removed. As there was no improvement in the paralysis of the left side after a month, laminectomy was performed, on the assumption that the paralysis was due to pressure on the cord by a fragment of bone, or to peripachymeningitis, with local oedema of the cord. The arches of the third, fourth, and fifth cervical vertebrae were removed, but no loose fragment of bone could be found. There were, however, signs of peripachymeningitis. To the left of the middle

line the dura was adherent to the fourth cervical vertebra over a small area. This adhesion was severed. After the dura had been opened, and a considerable quantity of cerebrospinal fluid had escaped, a narrow groove was seen passing across the cord from behind and to the left, forwards and outwards. This wound of the cord, which had been gouged by the bullet, was closed by catgut ligatures, passing upwards and downwards, so as to unite the upper and lower margins of the groove. The wound in the dura was then closed and the operation completed. Three days later the movements of the left big toe were regained, and during the following days the paralysis of the left leg gradually receded upwards. Eleven days after the operation there were active movements about the ankle, and three days later the patient could also move his legs slightly about the knee. Movements of the left arm did not begin to return till about four weeks after the operation, when first the thumb, then the fingers, and finally the rest of the arm began to regain the power of movement, the paralysis gradually receding upwards. Though the use of the left leg was almost completely restored, that of the arm remained much impaired. Michaelis, while insisting that the operation was very successful, admitted that the reason for this success was not perfectly clear. It might have been due to relief of pressure on the cord, which, in its turn, might be traced to the drainage of cerebrospinal fluid. The improvement might also have been largely due to the closing of the groove in the cord.

Leva² reports that he has often seen paralysis of the bladder and intestine, as well as sensory dis-

¹ *Deutsche med. Wchnschr.*, 1915, July 8.

² *Deutsche med. Wchnschr.*, 1915, July 8.

turbances disappear spontaneously, and marked improvement in other symptoms occurs, even in cases in which there was evidence of complete transverse section of the cord (*multitudinis Querlesions*). It was, therefore, unwise early in the case to diagnose total division of the cord, and to give an unfavorable prognosis. Brown-Séquard's unilateral lesion did not run such a favorable course as the total transverse lesion (*Querlesion*). In some cases of injury to the cord there were only a few isolated symptoms. Thus, in one case in which certain nuclei of the medulla were involved, the symptoms were paralysis of the recurrent nerve, and unilateral atrophy of the tongue. In another case the symptoms consisted of difficulty in swallowing, loss of the patellar reflexes, and static atactic manifestations. In a third case weakness of the legs, diminution of the tendon reflexes, and diffuse sensory disturbances were observed.

Guleke said that he had come to the conclusion that it was often extremely difficult to learn the extent to which the cord had been injured, and that he was therefore in favor of early operation as a rule, for though this principle led to superfluous operations, it also saved the lives of many who would otherwise have died. He had performed 20 laminectomies, and in none had any harm been done. He did not advise this operation in cases complicated by severe pneumonia, meningitis, open and much infected wounds or "urosepsis." Hamothorax, on the other hand, is no contra-indication, but when it is present the operation should be performed under local anesthesia. In 10 of his cases the cord was completely crushed, and they all terminated fatally. In 5 other cases death was due to apnea. There were, therefore, only 5 recoveries among his 20 cases; but he was certain that 3 of the patients who recovered would have died had not the operation been performed. In these 3 cases splinters of bone or bullets were found in the cord, which they had much injured.

DIAGNOSIS OF GAS PHLEGMON BY X-RAY

Early in 1915¹ Payr called attention to the importance of distinguishing between superficial and deep gas phlegmon. When it was subcutaneous, multiple superficial incisions were often sufficient, whereas when the gas phlegmon was deep-seated, extensive incisions were usually inadequate, and had, as a rule, to be followed by amputation. This view has recently² been endorsed by Professor M. Martens, who added that the relatively benign, superficial gas phlegmon was far less common than the malignant deep-seated type. As far less radical treatment was necessary for the one than for the other, it was of the greatest importance to distinguish between the two, to amputate for superficial gas phlegmon on the supposition that the disease was deep-seated was bad practice. In most cases the differential diagnosis could be made

clinically or during an operation, but in doubtful cases the X-rays were of the greatest value in detecting and localizing gas. Though this method of diagnosing gas phlegmon has but recently been employed, Professor Krause of Bonn several years ago showed that subcutaneous emphysema was demonstrable by the X-rays. The first patient to be examined in this connection by Professor Martens was a dentist, who had been wounded below the knee by a fragment of shell. The X-rays showed an extensive layer of gas under the skin, covering the tibia, and bubbles of gas were also demonstrable between the various layers of muscles. The boundaries of the gaseous infection could be clearly seen. In spite of high fever and great swelling of the limb, the patient refused amputation, and insisted on the operation being limited to deep incisions. The further progress of the gas phlegmon was arrested, and the temperature fell; but, as so often happens, Professor Martens says, in such cases, gangrene set in, and the leg had to be amputated at the knee. Professor Martens had found the X-rays useful in revealing the extent and depth to which gaseous infection had spread, and in indicating the best site for incisions and the most suitable level for amputations. In addition to their prognostic, diagnostic, and therapeutic advantages in gas phlegmon the X-rays had, he said, a medicolegal value. A wounded soldier, who had been sent home, brought charges against the medical authorities for having amputated his right arm against his wishes and for insufficient reasons. He stated that he had been only slightly wounded, that he had been given a general anesthetic and that he had awakened without his arm. He had been operated on by a foreigner, against whom he brought a charge of malpractice, as well as against the senior surgeon in charge of the hospital in which the amputation had been performed. A skiagram which had been taken of the wounded limb clearly showed a fragment of shell and a fracture of the lower end of the humerus, separating the epiphysis from the diaphysis, which was displaced forward. The fracture involved the joint and was probably compound. In front of the fracture a dark shadow was cast by infiltration of the tissues with blood. The skiagram also showed lighter points, which were attributed by Professor Martens and several other X-ray experts to the presence of gas phlegmon. Consequently it was agreed by medical experts that amputation of the limb was the only means of saving the patient's life, more especially as it was proved that gangrene of the skin had already set in.

THE TREATMENT OF THE WOUNDED IN THE FIELD

Professor Körte of Berlin, who has been attached as consulting surgeon to the army in the West and later to the army in the East, has lately published in pamphlet form a lecture on the care of the wounded, which he gave on April 11. Owing to the host of publications by military surgeons at

¹ München, med. Wochenschr., 1915.

² Berl. klin. Wochenschr., 1917, July, 19.

the various fronts now appearing, he advises his colleagues always to state the locality where, and the conditions under which, their experiences were gained. Without such particulars, generalizations were apt to be misleading. He had found the organization of the medical service satisfactory, and he warmly recommended the policy of not attempting to make use of every medical officer in the field as a surgeon. In the treatment of wounds, including those inflicted under the dirty conditions of trench warfare, swabbing the skin around the wound with alcohol or tincture of iodine was found to effect satisfactory disinfection. In the case of bullet wounds, infection was usually so slight that immobilization and the early application of dressings were sufficient to ensure the patient's uneventful recovery. On the other hand, wounds inflicted by artillery were always to be regarded as infected. In his opinion, phlegmon, gas phlegmon, and tetanus were due to primary wound infection; secondary wound infections were rare under proper treatment. The modern infantry bullet, provided it did not strike sideways or inflict a wound at point-blank range, was more humane than the old infantry bullet. Like many other surgeons, he had not once seen a definite dum-dum wound.

RESECTION OF THE INTESTINE FOR METASTATIC ABSCESS OF THE MESENTERY.

Ulrichs¹ records the case of a soldier, aged 22, who was wounded on September 24 by a French infantry

¹ Deutsche med. Wchnschr., 1915, April 5.

bullet, which entered his right shoulder. After his discharge, which occurred before the wound of exit, just below the right scapula, had completely healed, he developed osteomyelitis of the left fibula. Accordingly, on December 24, osteotomy was performed, and on January 6 a gluteal abscess on the right side was opened. Towards the end of January occasional attacks of severe abdominal pain were accompanied by acceleration of the pulse and slight fever. There was no vomiting, and aperients were followed by normal evacuations. On February 4 the abdominal wall was rigid and next day there was marked resistance in the right, lower abdomen. Laparotomy was therefore performed, though a definite diagnosis had not been made. A much inflamed coil of small intestine was found, with a thickened, phlegmonous mesentery. Thirty-eight centimeters of the small intestine, which was neither twisted nor kinked, were resected. While the corresponding portion of mesentery was also being resected as near its attachment to the posterior abdominal wall as possible, an abscess in its substance was opened. The abscess was closed, the ends of the intestine were reunited, and the wound in the abdominal wall was sutured. Ulrichs suggested that in this case, in which recovery ultimately took place, the bullet wound of the shoulder must have been infected, and have been responsible for the metastatic, septic thrombophlebitis, the osteomyelitis, and the abscesses of the gluteal region and of the mesentery.

GYNECOLOGY

UTERUS

Cuthbertson, W.: *The Role of Uterine Fibroids in the Production of Sepsis.* Chicago M. Recorder, 1915, XXXII, 376.

In calling attention to the rôle which uterine myomata play in the production of septic conditions, the author reports a case which had been diagnosed as septic peritonitis. The patient was an unmarried woman, 26 years of age, who had been confined to bed for three weeks with fever, vomiting, abdominal distention, urinary incontinence, and amenorrhea for three months. Hemoglobin was reduced to 21 per cent, red cells to 1,500,000, leucocytes 9 per cent. Operation revealed a submucous cervical shield attached very low down in the cervix. The lower part of the cervix covered the top of the tumor like a bell, and this, together with its firm pressure at the vagina, caused it to act as a ball valve, preventing the escape of the menstrual fluid, which being retained and infected caused protracted sepsis, simulating septic peritonitis. The tumor showed two large areas of pressure necrosis.

The author makes the point that in the case of an infected fibroid there is no encysting process, such as occurs in acute adnexal infection, as a result of which the toxine is absorbed directly into the patient's system. Another feature is that in uterine fibroids, especially of the submucous variety, the patient's condition is brought to a very low ebb from long continued hemorrhages. CARRY CUTHBERTSON.

Stern, S.: *X-Ray Treatment of Uterine Fibroids.* Am. J. Obst. N. Y., 1915, LXIII, 397.

The author reports that with the Allers-Schönberg technique he treated some 25 cases getting satisfactory results in about 65 per cent of the cases treated. But at the time he finished this series the Freiburg school was reporting 100 per cent cures in the same classes of cases.

So the author went abroad to investigate the methods used in the German clinics. He found that at all of the important clinics they were using in toto, or with slight modifications, the Freiburg technique and that their results practically corresponded with those published by Krönig and Gauss. In these clinics he found that operations were performed only in the cases in which X-ray therapy was contra-indicated.

The author reports a series of 21 cases he has treated with the Gauss method. He states that he succeeded in getting a permanent amenorrhea in every case he has treated, provided the patient was over 40 years of age. In the younger patients it is much harder to get satisfactory results.

He reports 2 cases of unusual interest in that 2 patients he had treated successfully with the older method subsequently became pregnant and went through a normal pregnancy and labor.

In conclusion he emphasizes the following points:

1. The dangers of X-ray therapy in the treatment of uterine fibroids with proper technique are absolutely nil.

2. In cases where the establishment of a permanent amenorrhea is desired, the massive dose method (Freiburg method) is decidedly superior to the fractional dosage method, as it gives quicker and more satisfactory results.

3. In younger women where the aim is to get a diminution of the size of the fibroid, with a temporary amenorrhea and a reestablishment of menstruation, the fractional dosage method is preferable.

4. In these cases, in a comparatively short time after the reestablishment of menstruation, the patients may conceive, go through a normal labor, and give birth to normal children.

5. All uncomplicated cases of uterine fibroids are amenable to X-ray treatment.

6. The nearer the patients are to the climacteric period, the surer and quicker the results.

7. In cases properly treated, we can look forward to getting practically 100 per cent cures.

C. H. DAVIS.

Pfahler, G. E.: *Treatment of Fibroids of the Uterus by the X-Rays.* N. Y. St. J. Med., 1915, XV, 334.

Pfahler advises the use of the X-ray in myomata (1) in all cases in older women in whom there is already a well advanced anemia; (2) in all elderly and young women in whom there is marked organic heart-disease, diabetes mellitus, chronic nephritis, lung disease, and gaster with cardiac symptoms; (3) in all patients beyond the age of 45 in whom there is no contra-indication to the treatment. The older the patient and the nearer she has approached the menopause, the more prompt and satisfactory will be the result.

Its application is contra-indicated (1) in all cases of myomata where the tumor is pedunculated or can be excised without destroying the reproductive powers of the patient; (2) in fibroids that are believed to have undergone malignant degeneration, or that have become gangrenous, or that have become infected; (3) in tumors associated with disease of the adnexa; (4) in those which are producing such marked symptoms that the patient is endangered more by waiting two or three months for

results of röntgen therapy, than by results of an operation.

Modern X-ray treatment is given in series, each series of doses being separated by an interval of three or four weeks. As regards the question of malignancy occurring, the author finds on record no evidence of malignant degeneration in the relics of a myoma or fibroma that has retrogressed under röntgen treatment. He regards the possible danger to other structures or viscera as practically negligible. Menopause symptoms are much less severe than after operation that includes oöphorectomy, and in younger women menstruation subsequently recurs.

The conclusions are as follows:

1. Röntgen therapy must be looked upon as a very efficient adjunct to the gynecologist's armamentarium, and while the rays should be applied by the röntgenologist, he should work hand in hand with the gynecologist.

2. Deep röntgen therapy stops the hæmorrhage associated with uterine fibroids. This is followed by a gradual disappearance of the tumor. This atrophic process may extend over several years and continue long after the cessation of treatment.

3. The treatment of metropathic hæmorrhage is almost uniformly successful.

4. Uterine hæmorrhage occurring at the menopause, when not malignant, will usually respond very quickly. There should be an increase in weight and an improvement in the blood condition following treatment, and when this does not occur suspicion of malignancy should be aroused.

5. Some good results can be obtained in inoperable carcinoma. The deep röntgen therapy should be especially recommended as post-operative treatment in all cases.

CAREY CULBERTSON.

Frank, R. T.: The Choice Between Operation and Röntgenization of Uterine Fibroids. *Am. J. Obst.*, N. Y., 1915, lxxii, 408.

The author calls attention to the early enthusiasm of several German observers in the X-ray treatment of uterine fibroids. While in some of the German clinics most of the fibroids are treated with the röntgen rays, the following contra-indications were accepted by Döderlein and Krönig:

1. Pedunculated submucous fibroid partly extruding from the cervix.

2. A combination of fibroid and endometrial carcinoma.

3. Gangrenous and suppurating fibroids.

4. Fibroids in which rapid growth, profuse metrorrhagia and unsuccessful röntgen treatment makes the fear of sarcomatous degeneration likely.

5. Fibroids causing acute incarceration of the bladder. To this they add: "If in addition to the myomata, other complicating diseases are present, it is necessary to decide after due reflection, whether these *per se* necessitate an operative interference, in which case the fibroids, of course, would be removed at the same time."

In several tables of statistics the author tries to show the percentage of cases that could be treated with X-ray and the comparative safety of the two methods of treatment. He finds that the types of cases which give an operative mortality of from 1.5 to 2 per cent are because of complications excluded from the benefit of the rays. In the uncomplicated fibroids the mortality is 0.75 per cent, which compares favorably with Miller's "theoretical" X-ray mortality of 0.63 per cent.

The X-ray treatment of fibroids is both time-consuming and expensive. The cost varies from \$100.00 to \$500.00 according to the method used. Two or three months' time is required, and if there has been irregular bleeding the treatment must be preceded by curettage and examination of the scrapings. Because of these many requisites the author has found it inadvisable to use the X-ray treatment except in rare instances.

Where necessary or indicated the method is invaluable in the following cases: (1) when operation is absolutely declined; (2) in patients with severe heart-disease or grave nephritis who are bad operative risks; and (3) in a very small group in whom the psychological trauma of operation must be avoided at all costs.

C. H. DAVIS.

Novak, E.: The Relation Between the Degree of Menstrual Reaction in the Endometrium and the Clinical Character of Menstruation. *Surg., Gynec. & Obst.*, 1915, xxi, 336.

This study is based upon a review of some 2,000 clinical cases in the gynecological department of the Johns Hopkins Hospital. From these were selected those in which the endometrium had been removed, either by hysterectomy or by curettage. The number of these was 339. In some of these menstruation was irregular, while in others, whatever the character of the pelvic disease, the menstrual rhythm was undisturbed, the periods occurring with absolute regularity. Only the cases of the latter type, numbering 159, were utilized in this study.

The point of departure in all studies on the menstrual histology of the endometrium is the demonstration by Hitschmann and Adler in 1908 that the endometrium undergoes a cyclical developmental change from the end of one menstrual period to the beginning of the next. The high point of these hypertrophic changes is reached just before the onset of menstruation—the premenstrual phase. Marked variations are noted in different cases as regards the degree of this premenstrual hypertrophy. Do these variations bear any relation to the well-known differences existing in women as regards the clinical intensity of the menstrual flow? By comparing only endometria removed on corresponding days of the menstrual cycle, such a relation is shown to exist. Speaking generally, the more profuse the menstrual flow, the more marked the local hypertrophic changes in the endometrium. The less abundant the flow, the less striking the local reaction in the endometrium. The latter

must, therefore, be looked upon as playing an essentially passive rôle in menstruation.

An important exception to the above generalization is encountered in cases of anteversion of what is commonly called the congenital type. In this group the hypertrophic changes are, if anything, more marked than those noted in association with other pelvic conditions. This would indicate that the ovary, whose activity appears to govern the degree of hyperemia and of consequent endometrial hypertrophy, is not functionally deficient in such cases, as has so often been asserted. The scanty menstruation so often noted in cases of this type is perhaps due to a deficiency in a local factor whose activity permits of the passage of blood elements from the vessels toward and into the uterine cavity. Such a theory would seem also to explain the spasmodic dysmenorrhea so characteristic of congenital anteversion, for the engorged mucosa, acting as an irritant to the uterine musculature, gives rise to spasmodic and painful contractions of the latter. It is also possible that future work will show that the sterility which is so extremely frequent in such cases is due to a physiological rather than an anatomical deficiency in the uterus.

Watkins, T. J.: Prolapse of Bladder and Uterus.
Tr. Mississippi Valley M. Ass., Lexington, 1913.
OKC.

The author believes that the pathologic changes in the part of the bladder wall which is attached to the vaginal wall has not received sufficient attention. These changes are due to stretching of this part of the bladder wall and vesical symptoms result. The urethra is usually displaced downward and produces incontinence of urine.

The pathologic changes in the uterus result mostly from circulatory disturbances, i.e., congestion, edema, varices, and hyperplasia.

The operative treatment alone was considered. The following operations were advised, the choice depending upon the amount of prolapse and the age of the patient, as regards future pregnancies.

1. An advancement operation.
2. Vaginal fixation of the round ligaments.
3. The transposition operation (transposing the relative position of the bladder and uterus). This is also called the interposition operation.

Partial excision or amputation of the cervix is done with all these operations, as may be indicated, and a perineorrhaphy is made.

1. The advancement operation is a very valuable procedure, is well adapted for the cure of many cases, and is easily and safely performed. It consists chiefly in advancing the vaginal wall, including the submucous connective tissue, upon the cervix. The redundant tissue is excised. The peritoneal cavity is not opened. The bladder is freely separated from the anterior vaginal wall and the cervix. "Purse-string sutures" are passed through the vaginal wall, the fascia, the cervix, and out through the connective tissue and mucous membrane

on the other side. These sutures are so placed that they restore the urethra to its normal location and close the "ring" of the bladder hernia. This operation gives excellent results in cases of moderate prolapse, and does not interfere with subsequent pregnancies. It should displace all anterior hysterorrhaphies for reasons that must be obvious to all surgeons.

2. Vaginal fixation of the round ligaments into the vaginal wall is done in conjunction with the advancement operation in cases with a greater amount of prolapse, during the child-bearing period, and in cases of reposition of the uterus.

The chief points in technique, in addition to the advancement operation are:

1. Opening of the peritoneal cavity.
2. The purse-string sutures include generous loops of the round ligaments and may include some of the anterior tissue of the broad ligaments.
3. The transposition operation is the operation of election after the menopause. The fundus of the uterus is attached to the connective tissue and vagina sufficiently low to make recurrence of the bladder hernia impossible. The author has had no recurrence of cystocele after this operation, which he has been doing for seventeen years. The uterus is never an obstruction in the vagina when so placed. Modifications of the operation are given for cases of very large uterus and for cases of complete prolapse with a very small uterus.

The cavities of the uterus and vagina may be completely closed in very extensive cases of prolapse in old women, where there is no objection to occlusion of the vaginal canal.

Robertson, J. F.: Hydatidiform Mole. N. Y. M. J., 1913, 61, 614.

The important points as illustrated by the cases cited are:

1. The comparative youth of the patients and the plurality of multiparae.
2. The history of having missed only three or four menstrual periods.
3. The enlargement of the uterus.
4. The absence of severe, and sometimes of any, pain.
5. Continuous hemorrhage and severe anemia.
6. The inability to palpate placenta or the presenting part through the partially dilated cervix.
7. The absence of a fetus.
8. No history of having expelled vesicles.
9. The presence in two of the cases of a high leucocytosis.

The dangers are:

1. The retention of a portion of the mass within the uterus.
2. Subsequent development of chorio-epithelioma. Findley collected 110 cases in which he found that 16 per cent of cases developed chorio-epithelioma. The mortality was 10 per cent.

EDWARD L. CORNELL.

Muret: Physiological and Pathological Results of Ventrofixation (*Suites physiologiques et pathologiques de l'hystéropexie abdominale directe*). *Ann. de gynéc. et d'obst.*, 1915, xli, 545.

Muret emphasizes the importance of repairing the perineum and making a firm pelvic floor when ventrofixation is performed. Otherwise the prolapse will recur, and moreover intra-abdominal pressure may force the intestines down into the pouch of Douglas, forming a posterior vaginal enterocele. He has seen 2 such cases, in both of which the uterus had been fixed to the abdominal wall, but the floor of the pelvis had not been repaired.

Ventrofixation is also sometimes followed by ileus. The author has found 16 such cases in the literature, and discusses the various techniques of ventrofixation used in these cases. He has never had any such mishaps.

In elderly patients he fastens a large area of the fundus high up on the abdominal wall. The cervix is free and moves up and down with the movements of the bladder; the uterus is in constant contact with the underlying tissues, so that there is no possibility of incarceration of the intestine. In young women he makes the fixation much lower down on the uterus and on the abdominal wall. A median ligament is formed which unites the anterior wall of the uterus just below the starting point of the round ligaments to the abdominal wall just above the symphysis pubis. If the ligament lengthens the uterus returns to its normal position; if it does not the position of the uterus is a little higher than normal, but it does not interfere with pregnancy. He has performed 250 ventrofixations and has never had any intestinal complications. A. Goss.

Haines, W. D.: Hysterectomy from the Viewpoint of the General Surgeon. *Lancet Clin.*, 1915, civ, 241.

Regarding hysterectomy from the viewpoint of the general surgeon, Haines calls particular attention to the following facts:

1. Hysterectomy is the operation of choice in chronic infections of the uterus.
2. Total hysterectomy, after the method of Wertheim, is the proper operation for cancer of the uterus.
3. In certain cases of prolapsus uteri, hysterectomy gives the best results.
4. Fibroids of the uterus should be removed either by myomectomy or hysterectomy, when they are diagnosed.

In conclusion, the author believes that with an improved technique and the proper preparation of the patient, the mortality from hysterectomy should not be greater than 5 per cent.

HARVEY B. MATTHEWS.

Norris, R. C.: Emergency Treatment of Ruptured Uterus and Ruptured Ectopic Pregnancy. *Therap. Gaz.*, 1915, xxxix, 541.

In general the author recommends the tampon treatment for ruptured uterus, and abdominal

section for ruptured tubal pregnancy. In the treatment of ruptured uterus various statistics show the operative mortality ranging between 25 and 50 per cent. In a series of 140 cases reported by Kalomenpin, 97 treated without operation showed a mortality of 61 per cent; 33 cases treated by hysterectomy showed 33.6 per cent mortality.

D. L. BORMIS.

EXTERNAL GENITALIA

Holden, G. R.: Relaxed Vaginal Outlet; Its Diagnosis and Treatment. *J. Fla. M. Ass.*, 1915, ii, 65.

The author gives a brief outline of the anatomy of the pelvic muscles and their function, together with the results of any impairment of the pelvic diaphragm. In considering the question of diagnosis he emphasizes especially the pelvic examination with the patient in the standing posture.

No one fixed method is advised for operation, the procedures employed varying with the conditions. Union of the levator ani muscles, however, is considered a requisite for any successful operation.

Non-operative and palliative treatment is considered in some detail. While the author states that, all things being equal, operation is the best treatment for relaxed outlet, he finds many cases that are, for one reason or another, best treated by palliative measures.

Such cases are: (1) patients in whom the condition is slight and who may be expected to be cured by palliative treatment; (2) patients who are not first-class operative risks on account of age or some physical impairment; (3) women who absolutely cannot afford the necessary expense and loss of time.

The introduction of some form of suitable pessary is the palliative means usually employed. Before the introduction of a pessary all local inflammation or irritation must be cured. The tubes and ovaries must be normal and the uterus non-adherent. Abnormal positions of the uterus must, as a rule, be corrected.

The pessary must relieve the symptoms caused by loss of support. It must not, however, be so large that it causes discomfort or pain by its presence. The patient is not in any way conscious of a properly fitting pessary.

The proper selection and fitting of a pessary requires considerable care and skill. It requires careful measurements of the length and breadth of the vaginal canal.

The dangers of pessary treatment can be avoided by care on the part of the patient and strict supervision on the part of the physician.

Bernstein, H. A.: An Improved Method for the Repair of the Lacerated Perineum. *N. Y. M. J.*, 1915, cii, 650.

The rejoining of the separated parts of the perineal muscles or the substitution of muscular bands from nearby structures to take the place of those

destroyed is the operation of choice today, and marks the greatest advance in corrective surgery of this part of the female organism since the first perineum was sutured almost one thousand years ago. The author does not favor the old operation in which flaps of vaginal mucosa are raised, as this procedure disturbs the circulation; edema and sloughing are encouraged; infection invited; and healing delayed.

The steps in the author's operation are as follows:

1. With tenacula or sutures catch up the tissues at the entrance of the vagina just below the lowest caruncle on each side; make an incision between these two points, and after slightly separating the mucosa from the fascia make the incision into the fascia and raise it slightly from its bed.

2. With blunt scissors or the finger make an incision into the connective tissue on each side leaving the center intact, and expose the levator ani muscles.

3. Catch up the strands of the levator muscles on each side and bring them together in front of the central ridge with three or four chromic catgut sutures.

4. Close the triangles thus created by bringing the original guiding sutures together. Suture first the vaginal side of the wound from within out. There now remains merely a straight line of fascia and skin extending from the vagina to the bottom of the tear.

C. D. HOLMES.

Bonnot, E.: A New Technique for Perineal and Rectocele Operation. *Med. Rev. Rev.*, 1915, vol. 349.

Bonnot describes, with figures, a modified Montgomery perineorrhaphy. With the posterior vaginal wall on the stretch, for which the author uses Bonnot's or Gelpi's vaginal retractors, a horizontal incision is made along the mucocutaneous line of the vagina, close to the mucous membrane of the vagina. The mucous membrane of the posterior wall of the vagina is separated from the underlying structures for a sufficient distance. A long-bladed hemostat forceps is applied in a triangular fashion to this denuded flap and the mucous membrane between the forceps blades is cut away. This leaves the anterior wall of the levator ani muscles and rectum well exposed. The forceps are then released and all bleeding points secured. The levators are brought together with twenty-day chromic gut. If the rectocele is large, the muscles may be rolled together by two or three lines of sutures, placed one upon another. The mucous membrane is approximated by interrupted silk-

worm gut sutures which include the muscle beneath. The skin is closed vertically with interrupted silk-worm gut.

The advantages claimed for this operation are:

1. Open field of operation and, hence, complete control of hemorrhage can be secured.
2. Good approximation of the levator ani muscles.
3. Nice approximation of the skin and mucous membrane, preventing hemorrhage.

HARVEY B. MATTHEWS.

MISCELLANEOUS

Prochownick, L.: Gynecology and the Pancreas. (*Gynäkologie und Gynäkologie. Monatshefte f. Geburtsh. u. Gynäk.*, 1915, xlii, 241.)

The author describes in detail a case of necrosis of the pancreas on which he operated, and from this case and a review of the literature he concludes that the pancreatic juice, which is not toxic in itself, may become activated by certain processes and substances so that it becomes an active proteolytic toxin. This activation may be brought about by trauma or by necrosis of the cells of the pancreas. In either case there is a rapid intoxication of the whole body, characterized by serous-hemorrhagic exudate, hyperemia of the peritoneum, and fat necrosis. Necrosis of the pancreas may be caused by bacterial infection or by thrombosis and embolism.

After discussing the symptoms of necrosis of the pancreas, the author discusses the relation between this condition and certain gynecological affections; there being no doubt, he believes, that such a relation exists. In diabetes during pregnancy and in severe cases of pernicious vomiting there is an interaction between the pancreas and the sexual glands. Surgeons frequently report cases of women with chronic diseases of the gall bladder and ducts who have attacks only during pregnancy, labor, and the puerperium. One case is recorded in which necrosis of the pancreas followed the puerperium, and in several cases the surgeons have mentioned the fact that the woman had borne a child not long before.

Necrosis of the pancreas may be caused by acute and chronic gynecological affections that involve adhesions of the omentum or thrombosis in the veins of the omentum or mesentery. This is particularly liable to follow gynecological operations. There is no absolute proof of these assumptions of the author, but they should at least stimulate further observation along the same lines.

A. Goss.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Bland, P. B.: *Bilateral Tubal Pregnancy. Report Jefferson M. Coll. & Hosp.*, 1915, vi, 104.

The author reviews the literature and gives brief protocols of the 42 cases already reported.

While the majority of cases of this nature are of comparatively recent record, it is interesting to note that according to Jayle and Nandrot of the Gynecological Clinic of the Hospital Broca, Paris, a case of this character was first described by Jacques Noier, as early as 1595. The second was reported by Gabriel King in 1747, the third in chronological order by Moreau in 1853, and the fourth by von Ott in 1885. Some of the more recent reports must be accepted with a degree of incredulity, because many of them were not confirmed by microscopic investigation. However, the clinical picture in each was typical of tubal hæmatoma.

The author's own case is that of a woman 33 years of age. She was married at 26 and had since then gone through two pregnancies, the labors being instrumental at term. Her menstrual history was normal except for considerable pain during the flow. Her last normal period occurred December 23, 1911. On January 21, 1912, she stained a napkin, but on January 25, flowed for two days, normal in amount. On January 29 she was seized with violent tearing pain in the lower abdomen, became cold, pale, and faint. This attack lasted thirty minutes and six hours later another occurred. For two weeks subsequently she was more or less confined to bed. On February 12 and 13 she suffered from two further attacks of violent abdominal pain and on February 19 began to flow scantily. Operation was performed on March 7, 1912. The lower abdominal cavity was found to be filled with clotted blood, with intestinal and omental adhesions, and a large irregular mass was occupying the site of the right ovary and tube. The left tube and ovary were bound down by adhesions, and when freed a small dark nodular mass was disclosed in the inner ampullar portion of the tube. The uterus with both appendages was removed. Both tubal masses proved to be hæmatomata. In both, segments of chorionic villi were disclosed by microscopic section. On the left side the pregnancy seemed to be interstitial in location.

CAREY CULBERTSON.

Copeland, G. G.: *The Treatment of Eclampsia: Methods Used at the Toronto Western Hospital Obstetrical Department. Canad. J. M. & S.*, 1915, xxviii, 79.

Although a subject frequently written about, this contribution is of extreme interest. The author

briefly reviews the salient points about this disease, and the actual technique of treatment.

Eclampsia occurs in about 1 per cent of women entering lying-in hospitals, but is subject to wide variations. Most cases are in primiparæ, 80 per cent. Taking the country as a whole, the maternal mortality is about 25 per cent and the foetal mortality is more than 50 per cent. Regarding the etiology, the author believes that there is a specific eclampsia poison or group of poisons, probably of protein composition. There are two types of this disease: (1) the liver type, in which the patient is jaundiced, vomits, has a tendency to hæmorrhages; changes in the urine are not marked; albumin is small in quantity; the blood-pressure is not high; convulsions are not marked; coma is common; there is little if any œdema; and the pulse is poor. These cases do badly. The other type is the kidney type which is characterized by a high tension pulse, severe headache, and epigastric pain; nervous symptoms are marked; œdema is generally present; the urine is scanty, of high specific gravity, and contains a large quantity of albumin, blood-casts, granular and hyaline casts, and frequently free blood. On boiling, this urine frequently becomes solid. The total nitrogen excreted is markedly diminished. These cases usually have severe convulsions.

The actual technique of treatment as conducted at the Toronto Western Hospital is as follows:

1. Give one-half a grain of morphine sulphate, hypodermically, and repeat, using one-quarter grain as soon as necessary, but do not give chloroform.
2. Prevent the patient from injuring herself; have a sheet tied over her, so she cannot spring out of bed. In a fit, place a rolled handkerchief between the teeth to prevent the tongue being bitten, and turn the patient on her side to prevent the aspiration of vomitus, infected secretions, etc., that might easily give rise to an aspiration pneumonia.
3. Give 1,000 ccm. of normal saline at 100° F. under the breasts, not into them.
4. Withdraw a quantity of blood by aspiration of a vein, under antiseptic and aseptic precautions. This directly lowers the blood-pressure and removes a definite amount of the eclamptic toxin which is causing the convulsions and the high blood-pressure. The amount of blood to be withdrawn is a matter of judgment. A big, plethoric woman who is cyanosed can stand the withdrawal of 20 to 30 ounces easily, with the greatest benefit; the volume of the blood is replaced by the saline. In an anæmic, emaciated woman, with low blood-pressure, the abstraction of 5 or 10 ounces of blood does good.

3. Empty the uterus. Carefully examine vaginally to ascertain the condition of the cervix. If it is soft and will admit three fingers, get the woman prepared for instrumental delivery. Give a general anesthetic. Nitrous oxide and oxygen are the best, then comes ether. In case the cervix is rigid and small, use a good type of hydrostatic bags. This is the safest and surest means of dilating the cervix without trauma or shock, and it imitates Nature's bag of waters.

4. Eliminations: (1) By the intestinal tract. Give several enemas. When the bowel is unloaded, give a large enema of magnesium sulphate, two ounces dissolved in a small quantity of water. Having cleared the bowel, start giving tap water, about 110° F. Saline is not necessary. If possible, wash out the stomach and introduce two ounces of magnesium sulphate. (2) By the kidneys and skin. Hot packs and stupes are of the greatest service in overcoming the spasm of the superficial blood-vessels and thus lowering blood-pressure. They calm the nervous system and help in an indirect way to induce diuresis by relieving the spasm of the renal vessels.

5. An ice cap applied to the head calms the nervous system appreciably.

6. In cases of great depression, where the circulatory system needs stimulation, aromatic spirits of ammonia and atropine are good. A. H. SCHMITT.

Leavitt, F.: A Few Remarks on Cesarean Section.
St. Paul M. J., 1913, xvii, 561.

After reporting a series of his own cases, showing the different indications for cesarean section, the author states that the prognosis of section when performed by experienced surgeons and under favorable circumstances is, as far as the child is concerned, better than in the use of medium and high forceps, prophylactic version, or the induction of premature labor. It is even better than in breech, face, and breech presentations, persistent occipito-posterior positions, and prolonged expectancy.

Some of the advantages which he claims cesarean section has over what is termed natural or normal birth are: (1) it eliminates labor, which is quite as much to be dreaded as the operation; (2) it prevents trauma of the cervix, pelvic floor, and perineum. The child, too, escapes injury, and the delivery can be arranged under advantageous circumstances.

A. H. SCHMITT.

Brown, W. M.: A Modification of the Technique of Abdominal Cesarean Section. *Am. J. Obst.*, N. Y., 1913, lxvii, 405.

The author points in a general way to the development of the various modifications in the technique of performing cesarean sections, and quotes statistics showing the lowering in the mortality attending this operation. In a series of 40 cases under the author's care the death-rate was 10 per cent, and it included both primary and late operation on cases that had eclampsia, toxemia, placenta

prævia, tuberculosis, and heart-disease, as well as contracted pelvis. Many of the patients had more than one indication.

Believing that the greatest danger in the usual cesarean section is trauma of the peritoneum, especially trauma to the intestines and mesentery, with its resultant shock to the sympathetic nervous system, the author has made a modification of the Davis operation which he thinks will be of distinct value in most cases.

The high incision is made in the usual manner, about 10 cm. long, and entirely above the umbilicus, if possible. By pressure on the sides of the abdomen an assistant holds the uterus firmly up against the abdominal incision while the cut in the uterus is being made. When the uterus has been carefully opened, and before the child is delivered, the uterine cut is sewed to the abdominal wound with eight or ten interrupted sutures of possibly by a continuous suture. The operation is completed in the usual manner, these extra sutures being removed just before the closing layer is placed in the uterine wall.

The author thinks that this procedure lessens the trauma to the peritoneum and believes that it will be of distinct benefit. C. H. DAVIS.

Benthin, W.: Criminal Abortion. (*Über kriminelle Fruchtstreichung*). *Ztschr. f. Geburtsh. u. Gynäk.*, 1913, lxxvii, 374.

The author reviews the literature on the subject and gives statistics in regard to the frequency, the morbidity, and mortality of criminal abortion. From these statistics it is evident that even in East Prussia, where the population is largely rural, abortion is on the increase, though of course not to so great an extent as in the large cities.

Abortion is performed in all classes of society, and on married, more frequently than on single, women. While unmarried girls have abortion performed for the sake of escaping shame, the married ones resort to it for various social or economic reasons, on account of poverty, because they have too many children already, etc. In at least a fourth of the cases it is due to a desire to avoid the responsibility of having children. While it will doubtless be impossible to ever overcome the practice entirely, vigorous efforts should be made to suppress it. Some of the means suggested are strictly enforced laws against the sale of intra-uterine douches and pessaries. Even if these did not materially reduce abortion they would certainly reduce the morbidity and mortality from it. Another important thing is to insist on higher requirements for midwives. They should be trained and stringent regulations passed for preventing untrained women from practicing. Private obstetrical hospitals should be subjected to the most rigorous examination and control. There should be a law compelling the reporting of every case of febrile abortion. Other preventive measures will have to be of a sociological nature.

A. Goss.

Windell, J. T.: *Pyonephritis Gravidarum*. *Louisville Month J.*, 1913, xxii, 105.

The author carefully reviews the subject of pyonephritis gravidarum, not from his own experience but from the statistics of others.

In short nearly all observers agree that the bacteria can reach the renal pelvis by three routes, viz., (1) through the ureters, (2) through the blood-stream, and (3) through the lymphatic channels.

The organism most frequently responsible is the bacillus coli communis (80 per cent). The right kidney is more commonly implicated than the left. The diagnosis of pyonephritis gravidarum entails no special difficulty.

The main points in the treatment are: (1) absolute rest in bed; (2) fluid (preferably milk) diet; (3) mild catharsis; (4) hexamethylenamine (0.5 gm.) given every three hours night and day in a full glass of cold water, lessening the dose as the patient improves; (5) posture to relieve the ureter on the affected side, if the infection is single; (6) autogenous vaccine treatment.

The interruption of pregnancy is seldom, if ever, necessary with the above treatment.

A. H. SCHMITT.

LABOR AND ITS COMPLICATIONS

Hornstein, M.: *Contracted Pelvis and Difficult Labor*. *Am. J. Obst., N. Y.*, 1915, lxxii, 421.

The author gives the following summary of his paper: 1. Of 2,000 consecutive cases, only 42 had external conjugates of less than 17 cm.; of these 42 only 7 had true conjugates less than 9 cm. They all had spontaneous labors except 4, and these had complicated presentations.

2. The children born of these women were of moderate size corresponding to the slender build of the mothers.

3. Of the 2,000 cases 97 required operative assistance, but only had pelvis which can be classed as contracted and the causes of dystocia were various, such as occiput posterior, transverse, weak pains, prolapsed arms, brow, etc. The presence of contracted pelvis in some of these was only a coincidence.

The conclusions are: 1. Small external measurements when they are all proportional with an external conjugate of 15 cm. or over, provided they are found in women whose slender build accounts for a small pelvis, deserve a fair test of labor. They usually have small children and will deliver spontaneously if the fetus presents favorably.

2. A fair test of labor in a doubtful case and especially in a primipara must include a period of four to six hours in active labor with the membranes ruptured, although, as a rule, three hours will decide the outcome.

3. Cesarean section for relative contraction in a primipara means repeated cesarean for subsequent children; whereas extraction of the child through Nature's passages, even if it should result

in a stillbirth will enable the woman to deliver her subsequent children *per viam naturalem* since a good deal of resistance, which is encountered in primiparae, is due to the soft parts. C. H. DAVIS.

Carter, P. J.: *Method to Lessen Perineal and Vaginal Tears During Childbirth*. *N. Orl. M. & S. J.*, 1915, lxxvii, 169.

For the employment of this method of delivery it is necessary that the patient be delivered on a table or some hard flat surface so that the rectum is plainly visible and the tip of the coccyx can be plainly felt. When the occiput is seen distending the vulva, the palmar surface of the left hand is placed over the head, while the fingers of the right hand are introduced below the rectum and just in front of the coccyx. The fingers of the right hand make a downward, inward, and upward excursion while the palmar surface of the left hand moves upward, both maneuvers aiding extension of the head and supporting the perineum. This is continued until the chin is caught by the right hand. Now when you wish to deliver the head simply push up the chin with the right hand and guide the occiput with the left, which imitates the third maneuver in the mechanism of labor. Once the head is delivered, grasp it with the palms and pull it in a downward direction until the anterior shoulder is under the symphysis, as far as the middle of the humerus. Then with the left hand and wrist support the head while the right hand supports the perineum as in delivering the head. The author advocates the use of a few drops of chloroform after the head is controlled at the vaginal outlet.

C. D. HOLMES.

Stoddard, J. M.: *Complete Intraplaccental Uterine Rupture During Labor*. *J. Indiana St. M.*, 1915, viii, 421.

The author reports the case of a patient, aged 23, who had had general good health prior to marriage, but had had six abortions since that time, the pregnancies ranging from two to three months. She was again pregnant at term. On examination the os was found not dilated, the cervix projecting, a head presentation, the fetus alive. The pains were mild and ineffectual; the membranes had ruptured the night before. On gentle manipulation of the fetus pains began and recurred at regular intervals. Shortly, the character of the pains suddenly altered and general abdominal discomfort supervened. The pulse was 145 to 150, the countenance pallid, the extremities cold and numb, respiration sighing, and the patient had a sense of impending death. Dilatation now was the size of a quarter; no blood was escaping from the os, but the abdomen was distended with fluid. A diagnosis of internal hemorrhage was made, and a cesarean section was done. On opening the abdomen large amounts of free and clotted blood escaped. The fetus was pale and limp, and could not be resuscitated. A lineal tear three inches long was found

in the uterus through the attached placenta, but no part of the fetus projected through the tear. The lining of the uterus was degenerative and of a dirty yellow color. The uterus was removed entire. The patient, being moribund at the time of operation expired on the table. C. D. HOMES.

Rothschild, C. J.: Episiotomy, a Perineal Safety Measure. *J. Indiana St. M. Ass.*, 1913, vol. 416.

The author discusses the indications for this operation, gives the technique for the same, and a table showing its use in the practice of some prominent obstetricians.

The indications for episiotomy are vulva infantile, with fully developed internal genitals; extremely large ligamentum triangulare, former perimorrhaphy; narrowing of the introitus due to pathologic conditions, such as urethra, hematoma of the vulva, abscess of Bartholin's gland, neoplasms, extremely large condylomata acuminata, extremely high degree of vaginismus, rigidity of perineum; brittle-like perineum (in old primiparae); extremely large fetal head, or pathologic presentations—breeched, parietal, face; forceps delivery; a strong indication for episiotomy is the condition in which the head, in the presence of good pains, does not come down into the vulva, but the occiput seems to be going forward—the posterior part of the perineum bulging, while the anterior part remains flat.

When the head has stretched the levator muscles; when the anus opens up and comes forward; when the perineum is seen to be resistant and about to tear; then is the time to do an episiotomy.

The blunt-ended blade of a pair of scissors is placed on the mucosa of the vagina and the other blade outside on the skin between the anus and the tuber ischii, and with the cutting angle at the median raphe, the sphincter is pushed downward and the blades quickly closed. C. D. HOMES.

Rongy, A. J.: Twilight Sleep. *N. Y. St. J. Med.*, 1913, 37, 149.

The author makes the point that this method of treatment must be judged from the standpoint of analgesia and not of amnesia, ignoring the testimony of the patients as incompetent. His report is based on experience in a series of 400 consecutive cases in the obstetrical services of the Jewish Maternity and Lebanon Hospitals.

As regards results, these cases are divided into three groups, as follows: (1) 211 cases, 77 per cent, in which there was complete amnesia with varying degrees of analgesia; (2) 37 cases, 12 per cent, in which there were varying degrees of analgesia without amnesia; (3) 31 cases, 11 per cent, in which the treatment failed to produce the desired effects. The author formulates his conclusions as follows:

1. Standard solutions are absolutely essential for the success of the treatment.

2. No routine method of treatment should be adopted. Each patient should be individualized and the mental state made the guiding point for the

injections of scopolamine. A subconscious state must be evenly maintained.

3. Facilities should be such that the patient is not unduly disturbed.

4. A nurse or physician must be in constant attendance.

5. This method of treatment is best carried out in hospitals but can be utilized in the home, especially if not begun until the end of the first stage of labor.

6. It does not affect the first stage of labor but the second stage is prolonged.

7. Pain is markedly diminished in a great per cent of cases, while amnesia is present in 75 per cent of patients, but labor is not painless, as is generally supposed.

8. This treatment does not in any way interfere with any other therapeutic measure which may be deemed necessary for the termination of labor.

9. Fetal heart sounds must be carefully watched. Sudden slowing calls for immediate delivery, if possible, or treatment must be discontinued. Fifteen per cent of the babies were born oligopneic.

10. Asepsis and antisepsis cannot be rigidly enforced.

11. No change in the course of the puerperium was observed, and convalescence progressed very smoothly in the entire series.

12. Women of a higher grade of intelligence are best suited to this form of treatment.

13. It is best carried out in primiparae or in multiparae with tedious labors. It has no place in short labors.

14. It is an ideal form of treatment in patients suffering from cardiac disease.

15. If the physician, as well as the patient, will be satisfied with amnesia as the object to be accomplished, then only will the scopolamine-morphine treatment be established in its proper place in obstetrics. CAREY CHILDS.

Polak, J. O.: Morphine and Scopolamine Amnesia in Obstetrics. *J. Am. M. Ass.*, 1913, 10, 964.

Beach and the author have studied over 400 labors conducted under scopolamine-morphine amnesia. In this series there has been no maternal mortality and less than the usual morbidity. No child has been born dead. There has been no case of post-partum hemorrhage following any of these deliveries. A moderate degree of oligopnea was present in 15 per cent of the cases. Real asphyxia was noted less frequently than after ordinary labor. Three children died within the first ten days after delivery. All three were necropsied and the following were the pathologic diagnosis: diaphragmatic hernia with transposition of the viscera; hemorrhage into both suprarenal capsules; and microcephalus. The lungs were specially examined for atelectasis, with negative findings. The condition of the baby at birth and the spontaneity of its first cry are determined by the skill of the operator in producing the "twilight state" with the minimum dosage and the length of time of the second stage.

The following conclusions are reached:

1. The twilight sleep state is a reality and is applicable in any labor in which there is no primary inertia, marked pelvic contraction, or the presence of obstetric accidents.

2. It is especially applicable to nervous women of the physically unfit type.

3. It is a valuable adjunct in the management of borderline contractions for it allows the woman a full test of labor.

4. It is distinctly a first-stage procedure and bears the same relation to the first stage as chloroform and nitrous oxide bear to the second stage: it relieves the pain, but does not inhibit the progress of labor.

5. It is particularly useful in cardiac cases as it relieves the nervous apprehension and secures dilatation with less muscular effort.

6. It diminishes the shock of labor, whether that labor be normal, prolonged, or operative.

7. It does not diminish the milk supply.

8. It does not predispose to post-partum hemorrhage.

9. It does decrease the number of high forceps operations.

10. Finally, it has a distinct place in hospital obstetrics and should be tried out by those who have control of sufficient material definitely to determine its position in obstetric practice. EDWARD L. CORNELL.

Smith, E. W.: Preliminary Report on One-Hundred Cases Treated by the Scopolamine and Morphine Method of Gauss. *N. Eng. M. Gaz.*, 1915, 1, 476.

In 100 cases of twilight sleep conducted by the author, of which 68 were primiparæ and 32 multiparæ, 93 per cent were successful, analgesia and amnesia being induced in 93 of the cases. Of the 7 failures, 5 were under dosed, being too far advanced in labor to receive thorough treatment; 2 cases had complete amnesia for hours, but owing to a rush hour in the delivery room, received their last dose at too long an interval and had islands of memory.

As a result of the above cases the author has arrived at the following conclusions:

1. Large dark-complexioned women seemed to require larger doses, and small light-haired or red-haired women were most easily influenced.

2. About 4 per cent had some delirium; most of the cases requiring restraint suffered from distended bladder and seemed to feel discomfort, without realizing the exact nature of the trouble.

3. No hemorrhages were noticed and the percentage of cases delivered artificially was larger than the usual hospital average.

4. The secretion of milk is better, on account of the absence of fatigue, and the convalescence of the mother is usually better and involution more rapid for the same reason.

5. While the expulsive stage is somewhat lengthened, labor as a rule is shortened.

6. The secretion of urine is rapid and the bladder needs watching.

7. The drug must be pure and in standard solution.

8. Careful observations must be made of pulse, respiration, and fetal heart sounds.

9. A prolonged second stage should be avoided. Two hours perineal stage in primiparæ, and one hour in multiparæ, should be the rule, with earlier interference if indicated.

10. The maternal and fetal mortality was negative. W. D. PHILLIPS.

Davis, C. H.: Nitrous-Oxide Analgesia in Obstetrics; Its Advantages Over the Freiburg Method. *J. Am. M. Assn.*, 1915, LV, 992.

It is the custom at the Presbyterian Hospital to begin the administration of the analgesia whenever the uterine contractions become painful. If started early in labor, a higher percentage of oxygen is used and three or four inhalations given. Later less oxygen is used and five or six deep inhalations allowed previous to the bearing-down effort. The gas must be inhaled with the first suggestion of a contraction; after the patient has made strong traction on the straps, which are fastened to the foot of the bed, she is often given another inhalation containing a larger percentage of oxygen. In giving the analgesia the gas-bags should be only about half filled. The mixture required varies considerably and must be determined for each patient.

For the nitrous-oxide-air analgesia, the hospital has a machine with an automatic regulator and a foot control. This apparatus has an advantage over that used by Guedel in that a constant pressure in the gas-bag can be maintained and the administration throughout labor may be controlled without assistance. In the maternity ward of the Presbyterian Hospital a mixing apparatus is used equipped with automatic regulators, by which a constant pressure in the gas-bag can be maintained. The use of this apparatus lessens the amount of nitrous oxide and oxygen used. For use in the home there is a similar machine, but on a smaller scale, so that it may be carried easily in an automobile. The mixture of the gases is accomplished with a single dial so that the nurse or intern, if at the hospital, or some member of the family, if in the home, may readily give the proper mixture. Since the patient should make traction during her pains, self-administration is not practical during the latter part of labor, although it may be used in the early part.

By using nitrous oxide and air, analgesia has been maintained for three and one-half hours with a 100-gallon tank of gas. After considerable experimenting, the hospital made a charge of \$1.50 per hour for the nitrous oxide and oxygen used in maintaining analgesia. As large cylinders are used, allowance for leakage is allowed and usually gives the hospital a small profit.

In no case has it been necessary to maintain the analgesia for longer than six hours. In multiparæ

it is rarely necessary to give it for more than two hours. In primiparae the labor is usually terminated in less than three hours from the beginning of the painful contractions. Should an operative delivery be necessary, the analgesia is increased to anesthesia. Much depends on the prenatal care of the mother and the position of the child. In maintaining analgesia the confidence of the patient is necessary and mental suggestion is of great value.

In no case will the analgesia lengthen labor; rather it will shorten it because of better assistance on the part of the mother. Of course it is easier to carry a hypodermic needle than a gas machine, but the "Freudberg method" should be used only by the specialist while nitrous oxide and oxygen analgesia may be employed safely and efficiently by any physician. It is as safe in the home as in the hospital. It may be used in all classes of cases, the results varying with the cooperation of the patient and the skill of the obstetrician. It gives an increased control over the patient in that there are none of the hysterical outbursts so often seen in the delivery room.

EDWARD L. CHESSELL.

Craig, L.: Nitrous-Oxide Oxygen Analgesia in Obstetrics. *Chicago M. Recorder*, 1915, XXXVII, 134.

The use of nitrous oxide oxygen analgesia in obstetrics is proving to be very satisfactory, and upon observing and administering the analgesia in a number of cases, the author has found that the ratio of the gases and the amount required to produce analgesia varies with different subjects. She describes her technique as follows, the new apparatus originated by Dr. Will Walter being employed.

As the end of the first stage of labor approaches the gases are turned on, using about one-tenth of oxygen to about nine-tenths of nitrous oxide. The breathing bag is filled with this mixture and just before the uterine contraction the nose-piece or face-mask is applied and the patient is directed to breathe deeply and rapidly, keeping the lips firmly closed (if the nose piece only is used) so that none of the gases escape through the mouth. Usually six or eight breaths are sufficient to produce analgesia, and the patient is able to work with her pains and yet be unconscious of painful sensations.

Among the various cases observed the greatest length of time analgesia was employed, was 54 hours. The amount of nitrous oxide consumed in this case was, according to the author, unusually low, which was probably due to the efficiency of

the apparatus. The average length of the second stage of labor in 1,500 cases was one hour and 37 minutes; ordinarily the administration of the analgesia is not begun until the end of the first or the beginning of the second stage. Just before expulsion, the face-mask is applied and a deeper anesthesia is brought about by the use of 3 per cent oxygen and 95 per cent nitrous oxide. At this time ether or chloroform vapor may also be added in a small cup at the side of the mask, for this purpose, and the vapor inhaled with the gas oxygen without removal of the mask.

W. D. PHILLIPS.

PUERPERIUM AND ITS COMPLICATIONS

Lindsay, A. H.: The Crime of Puerperal Sepsis. *Trans. M. Assoc.*, 1915, XVI, 10.

Every case of puerperal infection is a crime, while rigors and temperature are *prima facie* evidence of guilt, and judgment should be rendered without further introduction of testimony or even an argument unless the defendant can show beyond the question of a doubt that his victim was possessed of a pyosalpinx.

The fear of death or invalidism from childbearing is next to, if not the greatest, factor today in the question of race suicide. If the hypothesis is correct that women should not die as a result of childbearing, then it behooves scientific investigators and guardians of human life to ask "why?"

A novice in surgery who kills a worthless man through an error in technique either gets frightened so badly that he quits surgery or goes to some hospital and learns how to be a good surgeon. But if he kills a good mother from ignorance, carelessness, or indifference, instead of quitting or learning how, he goes the next day or night and kills another.

Why should the filthy hair be removed from the vulva and pubis and the *mons veneris* and labia be sterilized in a median line laparotomy and be left untouched in a confinement case either with or without a lacerated perineum?

The trouble lies in the barbarous and ignorant tradition handed down to us from the past ages. With all our scientific discoveries, we have not even yet been able to throw off the effects of the past thousands of years of habit. The average mother of today well understands the importance of absolute cleanliness in a surgical operation, but it is difficult to make her realize its importance in a confinement case.

EDWARD L. CHESSELL.

GENITO-URINARY SURGERY

KIDNEY AND URETER

Plotkin, T.: Results in Eighty Cases of Pyelography (Les résultats de 80 pyélographies). *J. d'uról.*, 1915, VI, 431.

Plotkin gives the details of 11 of his cases and 14 pyelograms, showing the conditions found. He describes the technique used in his service at Joseph's clinic.

If catheterization causes pain or hæmorrhage pyelography should never be performed. A small catheter should always be used, so as to permit reflux of any excess fluid and thus avoid overdistention. Many of the accidents reported have been due to overdistention. There were complications in only 3 of his cases. One patient had colic severe enough to confine him to bed for twenty-four hours; a second case had slight colic; and a third had fever and an excited mental state for four hours.

Ten per cent collargol is used, and is injected very slowly from a simple syringe containing 20 ccm. The patient is told to make it known as soon as he feels the slightest pain and the injection is then stopped. The amount injected varies from 2 to 30 ccm. More than 30 ccm. is never injected, even when there are large cavities due to hydronephrosis. The bladder is washed out afterwards with physiological salt solution.

Plotkin believes that pyelography is very valuable in the diagnosis of floating kidney and of the early stages of hydronephrosis. It is also valuable in pyelonephritis where stagnation of the pus has produced cavities, in cases of renal calculus, and of anomalies of the kidney, especially when there is a tumor of the kidney. In the hands of an expert the procedure is absolutely without danger, as it is nothing more than a simple rinsing out of the pelvis. A. Goss.

BLADDER, URETHRA, AND PENIS

Crissey, R. H.: Clinical Thermometer in the Bladder. *J. Mich. St. M. Soc.*, 1913, XIV, 473.

A very interesting and somewhat unusual case is reported by Crissey in which a clinical thermometer was lost while taking a vaginal temperature.

A young woman, 25 years old, while taking her temperature, placed the instrument *in situ* rather blindly and when she came to remove it, the instrument could not be found. It was at once reported, and the physician, thinking that it had slipped into the vagina beyond the patient's reach, made a vaginal examination but could find no trace of it. However, in rotating his finger anteriorly,

he accidentally felt the instrument through the anterior vaginal wall.

She was at once taken to the hospital, where, upon cystoscopy, the thermometer was located in a transverse position, the ends being covered with the mucous membrane of the bladder. The patient was then placed in the knee-chest position and a Kelly direct vision cystoscope was passed into the bladder, but on account of the highly irritable condition of the bladder, causing violent contractions, further manipulations were abandoned.

The patient was put to bed; hyosin and morphia given, and after a few hours the Kelly cystoscope with a pair of alligator forceps was introduced into the bladder, the instrument was seized and turned to the sagittal position. The cystoscope was then carefully slid down over the top of the thermometer until the end was reached, and accidentally the end of the instrument became engaged in the cystoscope which was immediately shoved down into the bladder over it. By means of the alligator forceps the thermometer was then easily recovered.

Crissey's reason for reporting his case is to warn against the indiscriminate taking of vaginal temperature, and more especially in allowing patients to take this temperature themselves. He believes that the taking of vaginal temperature is in all but rare cases uncalled for, as rectal temperature is just as reliable. H. W. E. WALTER.

GENITAL ORGANS

Hinman, F.: The Operative Treatment of Tumors of the Testicle; Report of Thirty Cases Treated by Orchidectomy. *Pacific M. J.*, 1913, LVIII, 636.

The author's conclusions are as follows:

1. Orchidectomy will cure from 15 to 20 per cent of teratoma testes. Obviously a cure is possible only when the testicle is removed before the onset of glandular or other metastases.
2. A cure cannot be assured until nine years after operation, although the danger of recurrence after four years is very small (only three cases reported) and progressively diminishes.
3. Cancer of the testicle metastasizes in practically every case first and primarily to a limited zone of lumbar lymph-nodes which lie on the aorta for the left testicle and on the vena cava for the right.
4. Involvement of these primary lymph-nodes may occur early or late.
5. The experience of various surgeons in a total of 46 cases has demonstrated in suitable cases the feasibility and technical ease of the radical operation with a combined surgical mortality in all cases of only 11 per cent.

6. Radical operation should never be undertaken when lumbar metastases are recognizable clinically.

7. Sufficient time has not elapsed and the cases are so scattered that it has not been possible to get the ultimate result in all of the patients treated radically. Forty-six per cent are alive, 1 for five years; 1 for four years; 3 for almost three years; 1 for over two years, and 11 for one year or less. There is a probable cure in at least 4 cases which had lumbar glands invaded with cancer at the time of the operation. Simple castration could not have benefited any of these cases, and their cure is directly attributable to the early and clean removal of the affected lymph area.

L. S. KOTT.

Merritt, E. P.: Epididymotomy; a New Operation. *J. Am. M. Ass.*, 1913, lxxv, 949.

The author describes epididymotomy as he practiced it in 75 cases of gonorrheal epididymitis with prompt relief of pain and discomfort.

The site is prepared as for any surgical operation on the scrotum. Three per cent iodine is applied to the field. A one per cent solution of cocaine is injected at the lower part of the scrotum, then the needle is pushed straight down, and a few drops distributed in the globus minor; an incision is made along the anesthetized line in the scrotum and the point of the knife is advanced into the globus minor, and several stab or punctures are made. A blunt pointed probe is then pushed along and blind avenues opened up. The wound is then packed with 5 per cent iodoform gauze and the scrotum kept well supported. No sutures are required.

THOMAS DUBOWITZ.

Ribbert, H.: Adenoma of the Prostate (Die Adenome der Prostata). *Beitr. z. path. Anat. u. z. allg. Path.*, 1913, lx, 149.

Ribbert asserts that there is no such thing as true hypertrophy of the prostate in the sense of an enlargement of the whole organ. The enlargement is due to adenomata. He gives 18 illustrations showing the histological structure of normal and enlarged glands in support of his statement. These adenomata originate only in certain parts of the gland. They begin in the posterior wall of the prostatic urethra in the region of the colliculus seminalis. Lendorf has called them accessory glands, but as the adenoma-producing glands extend somewhat into the lateral lobe, they cannot properly be so designated. But the rest of the prostate, the lower, lateral, and middle lobes, and the accessory glands on the upper side of the urethra do not give rise to adenomata. Ribbert suggests the name "anterior prostatic glands" for the part of the glandular structure where these adenomata originate.

Adenomata beginning in the region of the sphincter of the urethra project into the bladder; those in the body of the prostate compress the urethra. As they increase in size they compress the lobes of the prostate into a sort of capsule that remains when the adenoma is shelled out.

A. Goss.

Perrier, C.: Cancer of the Prostate (Contribution à l'étude du cancer de la prostate). *J. d'uro.*, 1913, xi, 437.

Perrier gives the histories of two cases of cancer of the prostate; one an adenocarcinoma, the other a scirrhous carcinoma. Hardness of the gland is given as one of the diagnostic signs by all authors, and in Perrier's second case this was practically the only sign present, for the prostate was not enlarged or changed in form. But in his first case the cancer had softened and broken down, so that the findings on palpation were practically normal. In his second case the prostatic lymph-glands were also hardened. These glands are involved earlier than the inguinal glands, involvement of which is generally given as one of the symptoms of cancer of the prostate.

Sometimes multiple metastatic bone tumors are found at autopsy, the origin of which would never be known if the prostate were not examined macroscopically, for it may not have presented any signs during life except abnormal hardness. Every prostate that is removed, even if the diagnosis is simple hypertrophy, should be examined for signs of malignancy. One of the author's cases showed metastasis in the corpora cavernosa.

In inoperable cases if catheterization is not tolerated the treatment that gives the most relief is suprapubic cystostomy.

A. Goss.

Lowale, O. S.: The Human Prostate Gland in Youth. *Med. Rec.*, 1913, lxxviii, 185.

The author has made a most painstaking examination of upward of 100 prostates taken at autopsy from individuals ranging in age up to twenty years, the article being supplementary to a previous contribution describing the gland of a newborn infant. The five developmental lobes of the prostate are found to remain distinctly demarcated from one another, though without individual capsules, throughout youth and adolescence, the most intimate relation being between the middle and the two lateral lobes; the most distinct demarcation existing between the posterior lobe and the middle and lateral lobes.

About the time of puberty there is a very marked increase in the size of the prostate, the gland increasing in size over 100 per cent, in all dimensions. Thus, in the first half of the first decade the prostate has an average length of 1.3 cm., a width of 1.5 cm., and a height of 0.9 cm., which by the end of the second decade have increased to 3, 3.8, and 2.1 cm. respectively. The growth of the organ is due to an absolute and relative increase in the amount of glandular tissue, the branches of the glands becoming much larger and more numerous. All the ducts except those of the anterior lobe were found to open either on the sides of the verumontanum, or in immediate proximity thereto. The glands of each lobe were always found to be quite distinct from those of its fellows.

S. W. MOORHEAD.

Barnett, C. E.: When Is a Prostatic Fit for Operative Procedure? *Tr. Mississippi Valley M. Ass.*, Lexington, 1915, Oct.

The stand is taken by the author that the general practitioner should learn the cardinal points of danger as to an immediate, non-preparatory operation from the surgeon selected for the prostatectomy, because of the preponderance of prostatectomies done outside of the genito-urinary surgeon's field.

Illustrating the danger from mere cystotomy, without pre-operative preparation, a death is cited, which, in Barnett's opinion, was caused from the effects of the anæsthetic coupled with the absorption of the toxic material from the floor of the bladder which heretofore was not absorbed, because of residual urine causing the venous plexuses to shrink on account of pressure, but when the suprapubic puncture removed the pressure, the now dilated veins fairly drowned the kidneys, whose tubuli were already partly blocked by the acidosis (colloidal swelling), thus prohibiting the excretion of bacterial bodies and inflammatory detritus.

With suggestions regarding the pre-operative preparation, the following contra-indications for prostatectomy are given: when the urine specific gravity is low; when renal function is low; when the urine is markedly acid or alkaline; when scanty urine or polyuria is present; immediately following withdrawal of residual urine; following cystotomy for retention; during gas distention of the bowels.

Regarding anæsthesia, the less fit the patient, the less general anæsthetic used.

The time consumed in the pre-operative preparation should be until the patient's percentage of improvement has reached its topmost degree, no matter if months are consumed.

Bonney, C. W.: The Preparatory Treatment for Prostatectomy. *Intern. M. J.*, 1915, xlii, 909.

When dealing with a case of prostatic hypertrophy there is not only a mechanically obstructed bladder, but also other organs, tissues, and systems which may have been affected by the retrograde changes incident to time or by destructive products of the disease, that require special attention; briefly summarized, the kidneys, the heart, and blood-vessels, the respiratory system, the gastrointestinal tract and the nervous system.

The drugs which will be found helpful in improving the condition, according to indications present in each case, are: Spartein sulphate, theocin-sodium acetate, diuretin, and potassium acetate with infusion of digitalis, the Niemeyer pill, the nitrites, and Basham's mixture in full dose. As a rule no direct treatment need be employed for mild nervous symptoms, as they diminish or disappear with the establishment of better elimination.

As to urinary antiseptics urotropine in large doses is of great value.

The treatment thus outlined, combined with

hygienic measures, will in the course of a few weeks improve the general condition of the patient.

As to local treatment, attacks of acute retention are to be relieved by catheterization, which may be facilitated by a urethral injection of adrenalin chloride, and even a little eucaine, to be followed by an injection of warm, sterile oil just before the catheter is introduced, and the bladder flushed with normal saline solution, weak permanganate of potassium or oxycyanide of mercury solution, or silver nitrate if there be a bad cystitis. Suprapubic cystotomy for drainage is recommended as a preliminary to enucleation of the prostate. It relieves vesical symptoms, improves renal function, and enables patients to gain strength.

In the selection of an anæsthetic, in the opinion of the author, ether by the drop method is the best if it be given by an experienced and skillful anæsthetist. Patients with bad bronchitis and emphysema may constitute an exception. Gas and oxygen are also recommended by men of large experience.

THEO. DROZDOWITZ

Aybard, L. E.: The Sexual Functions Following Suprapubic Prostatectomy—Freyer's Operation. *Am. J. Urol.*, 1915, xi, 367.

Concerning the causes which may produce varying results following suprapubic prostatectomy the question of advanced age alone is not enough.

Evidently it is due to a difference in the technique of the operation. It is probable that the suppression of ejaculation is simply exterior in the majority of cases.

According to Young's theory ejaculation takes place toward the bladder, and the first urine voided after coitus should be examined for the presence of spermatazooids to make sure of this point.

Freyer affirms in numerous writings that he has never met with weakened sexual power after his operation. Carrier has freely stated that suprapubic prostatectomy has given him disappointment from the standpoint of the preservation of the sexual functions.

Von Frisch says that following perineal prostatectomy patients lose their sexual power, but that this loss appears less certain after suprapubic operation.

Young and Fuller have noted improvement in sexual power after suprapubic prostatectomy. Pauchet also considers that after Freyer's operation the sexual functions are maintained, while Suter of Bale found that they were retained in 9 cases that he operated upon by this method.

Dernos in 1908 stated that the sexual function in his patients, operated upon by this method, had not been weakened.

Loumeau found that 6 of 17 patients operated upon by Freyer's method retained their genital functions. In 7 others these functions had ceased to exist before operation.

Kümmel's statistics recorded by Keyser show that in 101 patients (10 Bottini, 11 perineal and 80

suprapubic), 32 were followed for a sufficient length of time and of these only 3 complained of absence of ejaculations, but they retained their sexual power.

The author records a series of cases, some taken from the literature and 14 personally observed in the service of Professor Legues. In the 14 cases, the author noted that erection was absent in only one and diminished in another. Erections were normal and the sexual act accomplished in the other cases, but only 7 had external ejaculations.

The author comments that suppression of the sexual appetite does not appear to have occurred except in very old and weak subjects. Erection seems to have been preserved in the majority of cases.

Suppression of ejaculation may be due in many cases to the vasa deferentia being torn away, resulting in narrowed, deformed, or occluded openings. It is probable that in many patients the ejaculation, when not external, takes place into the bladder.

The author concludes that the results of suprapubic prostatectomy are rather favorable from the sexual standpoint, since in his 14 cases erections took place in 11 and external ejaculations occurred in 7 cases, while in Papin's records of 32 case-reports of the perineal operation, 51 had loss of ejaculation and erections occurred in only 11 cases.

H. G. HAMER.

Vinson, J. C.: Suprapubic Prostatectomy. *J. Fla. M. Ass.* 1915, 2, 71.

The author reviews the pathology of the disease, the technique of the operation, and the general management of the patient. He emphasizes the following points:

1. Recognition of prostatic hypertrophy.
2. The necessity of pre-operative care.
3. Value of suprapubic puncture.
4. Efficiency of suprapubic enucleation.

A clear conception of the hypertrophied prostate as being one of adenomatous overgrowth is insisted upon. This overgrowth alters the character of the bladder outlet, the prostatic urethra becoming elevated, contracted, and irregular in outline. All the resultant symptoms are those of urinary obstruction, this being secondary and affecting the bladder, ureters, and kidneys.

He claims that the real excuse for all operations in this condition is based upon the foregoing pathology and symptoms, and the fact, as Squier states, that 90 per cent. of cases will die within five years from the onset of obstruction without catheter life, and catheter life shortens this expectancy about 50 per cent.

The two-stage suprapubic operation is preferred by the author for the reason that a suprapubic puncture and drainage of the bladder is devoid of danger, and can easily be done under local anesthesia; all other means of effecting suitable bladder drainage have been unsatisfactory in his hands. After the

kidneys have regained proper function and the bladder condition clears up, and the general condition of the patient warrants it, an enucleation of the prostate is easily done under general anesthesia after slightly enlarging the suprapubic opening. He prefers to use nitrous oxide-oxygen anesthesia in most cases. Either by the drop method may be risked in a few cases, and chloroform in none.

A half-inch rubber tube is used for drainage, both for the preliminary puncture and following the enucleation. Hot boric acid solution is used t.i.d., and a solution of silver nitrate 1:4000 every other day as a bladder lavage after the preliminary puncture, and salt solution irrigation of the bladder used intermittently after enucleation. The author lays much stress upon the proper protection of the skin and tissues about the tube with sterile vaseline.

Within three or four days following enucleation (the patient is encouraged to pass urine) the drainage tube is removed in from three to six days, and the opening usually closes in from fourteen to twenty-one days. Fistula has never resulted in Vinson's experience. Urinary antisepsis are always used, and recovery is complete with the best functional results. Patients are always asked to return in three months for complete urinary and cystoscopic examination.

JOHN S. HILLIS.

MISCELLANEOUS

Cumston, G. C.: Sardou's Test for Blood in the Urine. *Am. J. Med.*, 1915, 21, 374.

The detection of blood in the urine by phenolphthalein has many practical applications in cases of mild hematuria or hemoglobinuria.

Whenever the test for albumin in the urine is necessary, if it is in small amount, it is essential to look for the presence of blood, which otherwise might give rise to erroneous conclusions as to the amount of albumin.

In these instances microscopical examination is insufficient because certain urines are directly toxic for, and have an osmotic action on, the red blood corpuscles, so that only the transudated hemoglobin can be recognized.

The slight hematuria in urinary lithiasis or nephroptosis incident to physical exercise, likewise early tuberculosis and renal cancer, may be detected by the phenolphthalein test.

The technique of the test is as follows:

1. Meyer's phenolphthalein reagent, prepared as follows: phenolphthalein 2 gr.; potassium hydrox 20 gr. dissolved in distilled water 100 gr.; to which is added impalpable powdered zinc 10 gr. This is brought to the boiling point, when the mixture will be red, but progressively becomes decolorized from the reduction of the phenolphthalein into phenolphthalin.

2. Acetic alcohol: acid acetic crystal 2 ccm., alcohol, 99 per cent., 98 ccm.

3. Peroxide of hydrogen at 12 volumes. Three cubic centimeters of non-filtered urine, just made homogeneous by shaking, are poured into a test-tube; then three cubic centimeters of acetic alcohol are added. The tube is then shaken and one cubic centimeter of Meyer's reagent is added and after again shaking, three drops of the oxygen water are added.

If the urine contains blood a more or less intense rose color should appear, according to the amount of blood contents present. The reaction is complete in from a few seconds to three minutes and retains its intensity for some time.

The test is quite as reliable as microscopic examination and has advantage over the latter, as according to the degree of molecular concentration of the urine, due principally to chlorides, the globules often undergo hæmolysis and can not be seen microscopically; also in hæmaglobinuria the microscope is useless.

Sardou has been able to obtain a slight reaction at the end of five minutes in a urine diluted to 1:5,000,000 and distinct reactions in urine diluted to 1:1,000,000.

A more distinct reaction is obtained by filtering the mixture of urine, acetic alcohol, and Meyer's reagent and adding 2 drops of oxygen water to 4 ccm. of the filtrate.

Sardou says that no other body in the urine can give the reaction, such as albumin, glucose, urobilin, bile pigment, indican, phosphates, acetone, or uric acid.

The same also applies to drugs such as antipyrine, the iodides and bromides, salicylic and carbolic acids.

Pus usually does not cause the reaction.

The author has found the test of value and very reliable.

H. G. HAMER.

Michelli, E.: Value of Degeneration of Leucocytes for the Quick Diagnosis of Genito-Urinary Tuberculosis (Sur la valeur de la dégénérescence leucocytaire pour le diagnostic rapide de la tuberculose uréo-génitale). *J. d'Urol.*, 1915, vi, 409.

Michelli discusses the difficulty of making a diagnosis of tuberculosis of the genito-urinary tract by the ordinary methods of examining the urine. In a considerable percentage of cases the bacilli cannot be found in the urine, and even when found, there is great difficulty in making a differential diagnosis between tubercle bacilli and other forms, especially the smegma bacillus.

Colombino has described a sign which he considers of great value in making a rapid diagnosis. It consists of a degeneration of the leucocytes in a fresh specimen of urine. A drop of the sediment is placed under the microscope and examined without staining. The form of the leucocytes is very variable; they may be elongated, polyhedral, or crenated. The contour is irregular; sometimes there are little globules of protoplasm at the periphery that seem about to become detached from the leucocyte, and it

looks as though the envelope of the cell had burst. The protoplasm around the nuclei is reduced considerably, as if eaten away; indeed, nuclei almost free of any surrounding protoplasm may be found. There are many vacuoles in the protoplasm of some nuclei. In addition to these changes in the leucocytes, red cells can be demonstrated microscopically in tubercular cases. Red cells are almost constant in tubercular urine, even when the patient is absolutely at rest.

Michelli believes that this sign is of great value in the diagnosis of genito-urinary tuberculosis, and describes two cases of his own in which he was enabled to make a diagnosis by means of it, when other methods of diagnosis had failed. Some authors have claimed that there is degeneration of the leucocytes in gonorrhoeal cystitis; there may be some slight change in the contour of the leucocyte in such cases, but there are never the pronounced and characteristic changes described by Colombino in tuberculosis. The value of the method is increased by its simplicity. Colombino emphasizes the importance of making the examination immediately after the urine is passed, to avoid subjecting the leucocytes to any traumatism. If it is allowed to stand, changes take place in the form of the cells.

A. Goss.

Williamson, T. V., and Budd, S. W.: The Complement-Deviation Test as a Guide in Infections of the Urethra, Prostate, and Vesicle. *South. M. J.*, 1915, viii, 781.

The authors state that the complement-deviation test is of great value in treating gonococcus infection of the urinary and sexual organs. The test becomes positive about the third to sixth week of the disease. It is frequently positive after all other methods to detect the presence of gonococci have failed. The test remains positive a month or two after a clinical cure. This period roughly corresponds to the time needed to develop antibodies in the blood at the beginning of the disease.

The chief value of this test is in the chronic cases in which the existence of the gonococcus is difficult to establish by any other method, and by it the authors state they are enabled to determine whether a man is still infectious or not even though he may have some slight discharge which the complement-deviation test shows is not due to gonococci.

The test also has a medicolegal value, particularly to determine who acquired gonorrhoea first, as between a husband and wife. V. D. LESPINASSE.

Ashcraft, L. T.: Report on a Series of Nephrectomies. *N. Eng. M. Gaz.*, 1915, l, 445.

The author gives his personal experience in a series of nephrectomies, all but two of which were performed on account of renal tuberculosis. He strongly emphasizes the necessity for nephrectomy in that disease.

In connection with the technique of operation he states that the majority of these kidneys were

removed through the curved lumbar incision, without resection of the last rib. In treating the ureter he follows Mayo's suggestion of cauterizing the stump with a 3 per cent solution of carbolic acid. In advanced cases, however, when the ureter must be removed, he advises removing the kidney through an incision made as if for exposure of the iliac artery, as suggested by Kelly and later popularized by Littenhal.

He considers Cathelin's method of dealing with the stump, to be ideal. It consists in drawing the kidney forward as far as possible, displacing it from its niche and wrapping it with a gauze compress. Next, the various elements of the stump are separated with the fingers, and held with the aid of another gauze pad. Each of the vessels is then taken up with an artery clamp, and tied separately, often without the patient's losing a single drop of blood. The best material for the ligature is catgut, provided that a good quality of No. 4 gut be employed. After the vessels have been tied separately, and the kidney has been removed, a general ligature is applied, half a centimeter beneath all the others, and is tied with a double sailors' knot. Finally, in spite of the great security of this method, another general ligature is applied, one centimeter below the other, No. 4 catgut being used. In this manner, one obtains a very safe ligation of the stump. Sometimes forcipressure is applied by means of a clamp having an elastic blade. This is retained in position for two or three days. The wound is packed with iodoform gauze, usually at the upper angle.

In speaking of the after-treatment, he says that for persistent cystitis, the bladder must be irrigated daily with 1:30,000 bichloride of mercury solution, commencing with 30 to 60 ccm. and at each subsequent treatment increasing the amount of fluid and the strength of the solution. Sometimes a six per cent carbolic-acid solution or a saturated solution of boric acid is employed. In all circumstances, after each irrigation, there should be injected 10 ccm. of a twenty per cent solution of carbonate of guaiacol, and one per cent iodoform, in olive oil. This seems to exert a remarkably beneficial effect on the bladder. By means of these methods the capacity of the bladder is increased. The urine becomes quite free from pus, blood, and debris, and the interval between the acts of micturition is prolonged from two and a half to three

hours. This is true, not only of those who have been nephrectomized, but also of those in whom the tuberculous process is too far advanced for operative interference. The procedure in the latter case is merely palliative. In the former, however, it serves to heal any local lesion that may arise in the bladder.

W. E. LEWIS.

Williams, B. G. R.: The Formation of Urinary Calculi. *N. F. M. J.*, 1913, vi, 609.

The author enumerates and discusses the chief theories of urinary lithiasis, a phenomenon secondary to alterations in the chemical composition and the urine. They are:

1. The theory of overplus salt content.
2. The theory of organic nucleus.
3. The theory of fermentation.

The experimental and clinical data of the author is to show that lithiasis is usually or always secondary to processes of fermentation, and, likely that the ferments are more elaborated by micro-organisms than by body cells.

In precluding his records of experiments the author states that the appearance in the urine of known body ferments (pepsin, lipase) does not cause deposition of crystals, nor do such ferments, when purposely added in small amounts, have any such action.

The author points out that in his clinical oxaluria hexamethylenamine gave the most beneficial results.

Antiseptics, as boric acid and camphor, were used in the author's experiments for sterilization. In all cases the results of these experiments tallied; namely, precipitation was thwarted or retarded by antiseptics.

By these experiments and observations the author feels justified in blaming fermentations, or processes akin, for the deposits of salts (especially oxalates) in the urinary passages. And these active bodies may be micro-organisms or their enzymes rather than true body ferments and concludes that deposits of certain salts in the urinary tract may be influenced indirectly by (1) overplus elimination, (2) concentration of urine; (3) presence of organic matter, etc.

He considers that deposits *in vivo* are directly accounted for by the action of certain ferments, doubtless of microbic origin. He also suggests that we might be dealing with ultramicroscopic ferment producers.

H. W. PLASSMEYER.

SURGERY OF THE EYE AND EAR

EYE

Stieren, E.: Congenital Coralliform Cataract. *Penn. M. J.*, 1915, xviii, 870.

Stieren reports a case of bilateral congenital cataract of both lenses, of the type known as fusi-form or coralliform, with radiating opacities resembling the branched twigs of a piece of white coral, between which the lens was clear, as was also the equatorial region. The affection was probably hereditary, as the father and grandfather both had poor vision.

G. D. THEOBALD.

Stieren, E.: A Case of Ectropion. *Penn. M. J.*, 1915, xviii, 870.

Complete ectropion, following an extensive burn of the entire right side of the face, resulted from cicatrization which involved the entire orbital region. Skin-grafting was resorted to, because no healthy skin remained any place near the eye that could be utilized for a flap.

G. D. THEOBALD.

Weisser, E. A.: Case of Congenital Malformation of the Cornea. *Penn. M. J.*, 1915, xviii, 870.

The author reports a case presenting a cornea almost completely opaque, in a slightly microphthalmic eye. The opacity was almost chalky white, but at a spot or two there was a partial clear cornea through which the iris could be seen. There was no staphyloma or other complications.

G. D. THEOBALD.

EAR

Lang, J.: Acute Suppurative Inflammation of the Middle Ear After the Removal of Nasopharyngeal Tumors with the Galvanocautery Loop (Über akute eitrige Mittelohrentzündung nach der Entfernung der Nasenrächentumoren mittelst der galvanokaustischen Schlinge). *Monatschr. f. Ohrenh.*, 1915, xlix, 287.

In 56 cases of nasopharyngeal tumors which were removed by means of the galvanocautery loop, acute inflammation of the middle ear was observed in 14; and in 4 of these it occurred twice in succession. In one of these cases the middle-ear inflammation and acute mastoiditis appeared without any demonstrable cause. This is not surprising, for in other affections of the nasopharynx, such as adenoid vegetations, the catarrhal or inflammatory condition of the pharynx may be transmitted through the eustachian tube into the middle ear.

In one case the acute middle-ear inflammation was the result of nasal irrigation. This leaves 12 cases in which the inflammation of the middle ear was caused by the removal of the tumor with

the galvanocautery loop. This is easy to explain. The catarrhal and inflamed condition of the mucous membrane of the pharynx caused by the tumor is greatly increased by the caustic action of the galvanocautery, so that it is much easier for it to be transmitted to the surrounding tissues. This inflammation is in the immediate neighborhood of the pharyngeal opening of the eustachian tube, and can very easily pass over its mucous membrane into the middle ear. The intensity of the inflammation is shown by the fact that the mastoid process is also often involved, and that even pyæmia has been produced, which, however, was cured by the injection of electrargol.

After removal of tumors from the nose and nasopharynx with the galvanocautery loop, acute inflammations of the middle ear appear in about 25 per cent of the cases, but nevertheless the operation should not be given up, for it is the simplest and least dangerous of all the operations for nasopharyngeal tumors. Excellent results have been obtained with it, and the inflammation of the middle ear is a much lesser evil than the dangers attendant upon the other methods of operation.

A. GOSS.

Bledsoe, R. W.: Acute Purulent Otitis Media Complicated by Mastoiditis and Temporosphenoïdal Abscess. *South M. J.*, 1915, viii, 823.

The author reports the case of a 6-year-old boy who developed a large swelling behind his left ear, for which a Wilde incision was made. The patient did very well for eight days when a right hemiplegia developed, and the patient lapsed into a semicomatose condition. A simple mastoid operation was performed, after which the patient regained the use of the right side; mentality was normal and the patient seemed on the road to recovery. This improvement lasted nine days when he began to relapse into his former semicomatose condition. At this time the temporosphenoïdal lobe was explored and an abscess found and evacuated. From this time on the patient made an uneventful recovery.

This case is of interest chiefly from the fact that a simple mastoid operation caused for nine days a complete disappearance of the symptoms of pressure on the brain.

OTTO M. ROTT.

Shambaugh, G. E.: Clinical Problems in Connection with Some of the Complications of Acute Otitis Media. *Illinois M. J.*, 1915, xxviii, 161.

While the author refers to the well-known symptoms of a typical case of mastoiditis, before and after

abscess formation, and of the complication of lateral sinus thrombosis, the most valuable feature of the article is the stress laid upon the fact that it is not always the typical textbook case which we encounter, but such instances as when an intracranial complication develops without any distinct evidence of softening in the mastoid and where even a sinus thrombosis develops where the evidence of an otitis media was limited to a slight congestion of the drum membrane.

Regarding mastoid symptoms, they are to be regarded with much greater suspicion if they develop after the ear has been freely discharging than when these same symptoms develop before the drum membrane has been opened.

The relative merits of transillumination and roentgenography of the mastoid are discussed, the latter being considered of more importance as a diagnostic measure.

Another important feature of mastoiditis upon which the author lays stress is the presence of urgent symptoms in the absence of abscess formation and the absence of these same symptoms in cases where an extensive abscess cavity has developed in the mastoid process.

The persistence of trouble after the mastoid has been operated on and the management of sinus thrombosis with and without breaking down of the thrombus, are discussed.

OTTO M. ROTT.

Woulfe, C. T.: The After-Treatment of the Mastoid Wound. *J. Opn. of the Larynx*, 1915, 32, 284.

This article deals with the after-treatment of the simple mastoid operation. The author lays stress upon the importance of the after-treatment, stating that the operation is only one step in the proper care of the patient.

Gauze packing is preferred to the blood-clot method because of the uncertainty of the latter. After suturing the upper angle of the wound, gauze is inserted quite firmly and a bandage applied. A strip of gauze is also inserted into the meatus to the drum. On the fourth or fifth day dressings are changed for the first time, providing no complications demand an earlier inspection of the wound. The stitch is removed and plain gauze inserted but with only moderate pressure, and care is taken to insert gauze under the border of the skin wound so as to prevent falling in of these edges. The gauze is removed from the meatus and if moist another piece is inserted. The dressings are changed every other day until the cavity is fairly filled with granulations, when the gauze is discarded in favor of boric acid powder.

A cause of non-healing is necrotic bone left, which needs to be curetted or which demands a secondary operation. Another factor is the general condition of the patient, which requires building up.

OTTO M. ROTT.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Sullivan, J. J.: The Examination of 106 Cases of Nasal Accessory Sinusitis, Showing the Value of Routine Examination and Certain Intranasal Operative Proceedings. *Laryngoscope*, 1913, xxv, 607.

The following routine is practiced by the author:

1. The nose is examined before and after contraction with cocaine and adrenalin.

2. The nose is syringed with normal salt solution, and the fluid collected in a black pus basin.

3. Transillumination.

4. X-ray and comparison with the transillumination markings of the sinus.

5. Positions: (a) Erect, head down, side examined uppermost; (b) head upward, erect, and erect slightly backward for the frontal sinus; (c) head forward on the chest for the sphenoid (anterior ethmoids sometimes give pus in this position); (d) head skyward in the prone position for posterior ethmoids.

6. Puncture and irrigation of the maxillary sinus under the inferior concha. After puncture a probe is passed through the opening and search made for thickened membrane, etc.

7. The middle turbinate is inflected and the ethmoid and frontal sinuses probed.

8. If necessary to examine the sphenoid and posterior ethmoids more closely because of urgent symptoms, the middle turbinate is removed.

As regards operations the author has had very satisfactory results with the Ballenger operation for the complete ethmoid exenteration and the Ballenger-Canfield operation on the antrum. Otto M. Rott.

MOUTH

Solenberger, A. R.: Subperiosteal Abscess of the Maxillary Sinus. *Calo. Med.*, 1915, xii, 269.

The author calls attention to the fact that in this particular affection the dentist must stand sponsor for the prophylactic treatment, and questions whether rhinologists have been sufficiently insistent upon the dentist's responsibility.

The symptoms are usually inconstant, the infection progressing slowly and often painlessly. The antral floor is often thick, often very thin with the apices of roots of teeth penetrating the floor. On the nasal side there is usually little change.

Periodical discharge of pus from the sac is as a rule preceded by pain usually of a facial neuralgic type which ceases after the evacuation. These patients are increasingly subject to infectious inflammations of the respiratory tract; viz., chronic rhinitis, bronchitis, pulmonary cellulitis, all of which disappear after cure of the abscess. Aspiration of

the sinus is usually negative and the X-ray is helpful only when the abscess has become thickened and distended.

Dental history is often not reliable and the removal of a tooth, unless it can be demonstrated to be the offending member, is bad practice, and in this extremity the author advocates an examination through a sufficiently large opening in the anterior wall. He was led to adopt this procedure by his experience in operating by the Luc-Caldwell method, when he frequently found a mass of granulation tissue in the floor of the antrum which often led to an abscess about the apex of a tooth. This condition he asserts is the cause of failure in many cases which had been done in an otherwise thorough manner.

H. A. POTTS.

Sticker, A.: Fifteen Cases of Cancer of the Mouth Successfully Treated with Radium (15 Fälle von Mundhöhlenkrebs mit Radium günstig behandelt). *Berl. klin. Wchnschr.*, 1913, lii, 1049.

Sticker describes 15 cases which he has successfully treated with radium, 3 of cancer of the tongue, 7 of the lower jaw, and 5 of the upper jaw. He gives the details of the case histories and describes the special holders which were made to hold the radium in place during the night. The radium was applied 12 hours each night, varying from three up to as many as fourteen nights. Some of the cases had not been operated upon, some were recurrences. Two of the tongue cases showed deep ulcers which healed under the treatment. In the third case a tumor the size of a cherry disappeared, and the pain, which had been intense, stopped. Two of the lower jaw cases are still under treatment, but show great improvement; one healed, leaving a fistula, the others all disappeared completely, not even leaving any scar tissue. One of these recoveries was seven months ago and there are no signs of recurrence. One of the upper jaw cases is still under treatment, the others have recovered, and two of the recoveries have persisted for seven months.

Sticker points out the superiority of radium treatment over surgery, especially in those cancers of the mouth, where operation is so disfiguring. The radium treatment leaves no deformity whatever. Moreover, he holds that in cancer general surgery tends to favor recurrence, that is, after removal of a uterine cancer there is apt to be recurrence in the vagina, whereas when the uterine tumor is left intact there is no involvement of the vagina. Radium treatment, on the other hand, tends to produce immunity. The destroyed cancer-cells are taken up in the body fluids and produce antibodies which immunize the body against cancer.

A. GROSS.

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SURGERY OF THE NOSE, THROAT, AND MOUTH

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COLLECTIVE REVIEW

TUMORS OF THE MOUTH

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THE majority of tumors occurring in or about the mouth are epithelial, and after middle life, with few exceptions, these are malignant.

While some of the connective-tissue tumors are even more malignant than the carcinomata, on account of their comparative rarity they are of less compelling interest.

Among the non-epithelial tumors are represented almost every form of new-growth with the exception of essential tumors of certain special tissues.

CARCINOMA OF THE MOUTH

Carcinoma of the mouth is usually of the squamous prickle-celled variety arising from the mucous membrane, though adenocarcinoma may arise from related glands, and basal-cell tumors do occur. Even in the antrum and nose, ciliated epithelium is replaced by squamous cells before cancer develops.

Carcinoma of the mucous membrane develops much more frequently in men than in women, in the proportion of about twelve or fifteen to one. It is a disease of the latter half of life, but has occurred in children. Pond cites a case of epithelioma of the palate in a boy of sixteen, and Hochenegg, one in a child of six years.

The majority of all cases can be traced to leucoplacia or some local irritation, and syphilis is supposed to be a strong predisposing factor. The general spread of syphilis and the use of tobacco in Europe toward the end of the Middle Ages are credited with producing a sudden increase in the occurrence of cancer of the mouth. Like cancer elsewhere, its frequency is still increasing.

Owing to their accessibility and the sensitiveness of the mouth the whole progress of these cancers can be observed better than in any other location, except the skin. Some of these precancerous lesions exist for years, some for a few months. The actual cancers themselves as a rule are rather indolent at first; and the indolent stage may exist for a long time, even years; this is especially true of cancers of the lip. A fewer number show rapid growth from the first, and the lymph-nodes have been known to become infected within three weeks after the appearance of the initial lesion.

A peculiarity of the disease in this location is that though it always will in time infect the lymphatics of the neck and in some instances very early, in but one per cent of cases does it cause distant or general metastases. Even when the neck glands are extensively involved, it is often curable, and apparent fixation of these nodes does not necessarily mean that they are inoperable, as it is only late that they become fixed to the spine and the carotid artery. Removal of all the structures of one side, with the exception of the internal and common carotid arteries, is not incompatible with life. In an old person with sclerotic arteries, tying the common or internal carotid arteries is equivalent to a death warrant (Kocher).

The virulence of cancer of the mouth varies in different locations; and as a general rule the operation becomes more serious the further back in the mouth the growth occurs.

The treatment formerly was always with escharotics or by removal, but recently X-rays

or radium have been used. With perfected technique, radical excision with or without the aid of the actual cautery is the one means that holds out promise for advanced cancer, and from very poor beginnings this method has now reached a stage of substantial achievement and with far greater promise for the future. The two causes of poor results are incomplete operation and late treatment. It is difficult to conceive of more radical operations than are now being practiced, but in regard to the average time at which the disease is brought to treatment, there is much room for improvement. That this unfortunate state of affairs is through educational efforts being radically improved, will be shown in the study of the history of statistics of cancer in various parts of the mouth. From these it would seem not improbable that at no distant time the percentage of cures for cancer of the mouth, with the possible exception of those arising in the upper jaw, will be higher than in any other part of the body.

CANCER OF THE TONGUE

At no place in the history of this disease is one able to point out any single piece of work or the work of any single man, that might in itself be considered epoch-making. While the great practical studies have all been made in the last thirty-five years it is to be remembered that these are times of anesthetics and asepsis. The men who have accomplished the most noteworthy results in this field, have done so, not through inventive genius or initiative, but by the adaptation of knowledge and technique already at hand. It is most significant that with a possible exception of wide-necked dissections, there is not a single individual technical step of importance that is used today that was not used or attempted before this period. But these recorded master strokes were by comparison few and far between, and distributed over centuries, and it is only in perspective that they can be identified, their real value at the time being little appreciated.

The use of the actual cautery was advised by Hippocrates, abused for twenty centuries, decried by Butlin, and is again being popularized.

It was in the sixteenth century that Ambrose Paré sutured the tongue for injury; but it was in the nineteenth century that von Langenbeck first approximated the tissues by suture after the removal of a tongue tumor.

In the seventeenth century an instrument was used to control hemorrhage from the tongue; but up to the nineteenth century the cautery and ice were the usual hemostatics of election.

Butlin did Whitehead's operation in most of the cases in his remarkable series and this "Whitehead operation" is a combination of the ideas of Roux and Fiedler.

Kocher and von Langenbeck's names are used indiscriminately in designating certain other types which rest upon the work of Jaeger, Regnoli, Sedillot, and Billroth.

A clear clinical description was given of carcinoma of the tongue in the seventeenth century, yet in the papers of Ferguson, 1801, Earle, 1823, and Traves, 1870, no clear distinction is made between syphilis and cancer.

It is true that up to the last half of the nineteenth century the treatment of mouth lesions did not keep pace with medical progress along other lines, but this seems to have been due more to lack of coordination than lack of individual observations or ideas.

The names of von Langenbeck, Roux, Regnoli, Sedillot, Billroth, Whitehead, Kocher, and Butlin are associated with the greatest advances; and a review of the literature for the past five years shows little of value that is not to be found in the later writings of Butlin.

The first clear description was by Wiseman in 1671, but it was not until the middle of the last century that carcinoma was clearly differentiated from syphilis. Microscopic differentiation began with Virchow and Rokitsansky, but Sir James Paget in a footnote to his lectures on surgical pathology claims to have described their papillary origin in 1858. It was the microscope that finally distinguished cancer from lymphangioma and macrodossia.

Hippocrates recognized ulcerating cancer of the tongue and spoke of the value of the cautery. Galen believed cancer due to black bile, and his teachings for a long time held in check active local treatment.

Celsus advised the cauterization or removal of ulcers that could not be cured otherwise; and about the sixteenth century excisions began to be practiced occasionally, but always in conjunction with the cautery. These excisions were hurriedly and inadequately done, yet surgeons for centuries had been acquainted with fairly good speech results following the removal of the tongue for torture or punishment, from its loss from small-pox and, later, from mercury. Possibly the surgeons were more particular about their operative death-rate than were tyrants or disease.

In 1664 De La Motte ligated the pedicle of a tongue tumor with silk.

In the eighteenth century several successful operations for cure of cancer were reported, and

at this time Heister of Helmstadt warned that the disease must be clearly excised in healthy tissue, otherwise it would return worse than before. At this time it is recorded that after excision of half the tongue by Buxdorf, the disease returned nine months later in the parotid and sublingual glands.

All through the centuries there is reported an increasing number of tongue operations, and in 1720 Dr. Walter Harris, before the Royal College of Physicians, said, "The excision of cancers of the mouth and lips, especially of the tongue, all involve the greatest danger to life. But if any one is exceedingly wearied of such tumors and especially dejected in his mind . . . he should not be denied the trial of operation by excision."

Benjamin Bell in his "Surgery" of 1786 gives a chapter on disease of the mouth and tongue and extirpation. He used a twisted wire loop which was an early instance of an *ecraseur*.

In 1800 Home described cases treated by ligation of the growth *en masse*, later removing the slough, and this practice continued as late as 1884 when it was recommended in both Liston's "Practice of Surgery" and Erichson's "Surgery."

The use of caustics inserted around the cancers continued in use, and this was recommended by Maisonneuve as late as 1858.

Modern operative methods began with C. J. von Langenbeck, who in 1819 applied wedge-shaped excisions similar to those used for cancer of the lip with immediate suture.

In 1827 Major split the tongue in the midline and strangulated the diseased half with ligature. In the same year Cloquet attached the tongue from below the jaw, using a strangulating ligature.

In 1833 G. Mirault first did or attempted preliminary ligation of the lingual artery in the neck of a living person.

In 1831 Jaeger first divided the cheek to facilitate approach.

In 1838 Regnoli removed the tongue through the floor of the mouth by a submental incision.

In 1839 Roux did the first unquestionably successful preliminary ligation of the lingual artery in the neck with amputation of the tongue. This was done by clean incisions and without cauterization, and this seems to have been the first instance of excision of the tongue on modern lines.

In 1844 Sedillot divided the lower lip and jaw near the midline to facilitate approach to the tongue. In doing this, Butlin thinks he may have been preceded by Roux but is not sure.

In 1861 Billroth resected the lower jaw near the cuspid tooth.

In 1852 Chassaignac first used a chain *ecraseur*; and by going through the various steps of a modern Whitehead operation with three *ecraseurs*, one for the base of the tongue, one for the midline, and one for the tissues in the floor, Nunneley, 1861-1870, had remarkably good immediate results, operating upon five cases without a single post-operative death.

The galvano-*ecraseur* was introduced about the same time as the chain instrument.

Morrant Baker used the *ecraseur* slowly, taking thirty minutes to cut through the tongue, and in the end having a pedicle containing the artery that was easily ligated before final division. He previously freed the tongue by cutting its muscles from the genial tubercles.

Fiedler improved the technique of cutting through the body of the tongue by making small snips with the scissors until the blood-vessels were reached.

In 1850 Hilton first divided the lingual nerve for relief of pain in an inoperable cancer.

Modern operations are essentially of two characters, the Whitehead operation described, 1877-1892, which is an anatomic intra-oral operation; and the various operations, with the development of which Kocher's and von Langenbeck's names are closely linked, which attack the tongue through a temporary resection or from below the jaw, and which attempt to remove the involved lymphatics at the same time. The first attempts to systematically remove the lymph-nodes are difficult to trace. Its most radical expression is to be found in Crile's block-excision of all the infected neck and mouth tissues *en masse*; but extremely effective and less radical operations in the neck have been practiced by Whitehead, Butlin, and Kocher, theirs being still the operations of choice in most cases.

The introduction of antiseptics, chiefly the use of iodoform gauze in Billroth's clinic, greatly reduced the mortality in neck and mouth dissections.

Cancer of the tongue, like cancer arising in other parts of the mucous membrane of the mouth, is almost without exception of the squamous type; but two reported cases of columnar epitheliomata arising in the tongue have come to our notice. Seventy-five per cent or more arise in some previously existing lesion, most commonly a leucoplacia. The belief that leucoplacia is a syphilitic lesion is constantly growing, and some later writers state that the proper treatment of syphilis will go far in the elimination of cancer of the tongue.

The importance of alcohol, spices, and tobacco as primary etiological factors is less apparent than formerly believed; but these, as well as mechanical irritation, are still to be reckoned with.

The most common site of origin is on the dorsum or borders, which are the most common locations of the supposedly precancerous lesions, but no part of the tongue is exempt. Numerous cases of double origin are recorded.

The age of the patient is usually between forty and sixty years, and the predisposition increases with age, but 30 cases are recorded in patients below thirty years, 8 in males and 22 in females, but on the whole the disease is much more common in men, the average being about 15 per cent in women. This latter fact has been accepted as one evidence of the rôle of tobacco as a factor, but it has been shown by von Winiwarter that the oriental women who smoke are not more subject to it than non-smoking women of the Occident.

All are agreed that the cures of cancer of the mouth should be very close to 100 per cent and that this should be the practical as well as the theoretical result. The greatest stumbling block is the late period at which treatment is instituted in a disease that is perfectly accessible and evident usually for a considerable period before it loses its purely local character. Therefore, aside from the attempted elimination of predisposing factors, the most important element in treatment is the education of physicians, dentists, and the public to the necessity of early recognition. In England, for some years previous to 1910 it is estimated that but 70 out of a total of 800 cases of cancer of the tongue were successfully treated annually, and this after Butlin had spent years in educational work. Previous to 1916, of 172 cases of cancer of the mouth treated in the Massachusetts General Hospital, 29 per cent were inoperable when they entered. Wolfer recorded 14 per cent of recoveries in Billroth's clinic that lasted nine months. That there is reason to hope for increasingly better results is shown by a late report from Johns Hopkins Hospital. Taking a period of eighteen years previous to 1906, of subsequent years including and after 1908, it was found that during the first period 8 per cent were early or precancerous lesions, while in the later period these increased to 30 per cent. During the first period 25 per cent of the cases were very late or inoperable, in the second period these were reduced to 20 per cent. During the first period the cures amounted to 71 per cent, while in the second period they are reported as 50 per cent. In very

early cases the operative death-rate should be nil; as the disease increases in extent the operative death-rate grows to 10 per cent, for advanced cases still operable from within the mouth, to 30 per cent when the floor of the mouth or jaw is involved, and even to 80 per cent in the more radical procedures, 50 per cent of these deaths being due to pneumonia. Along with this increase in the primary mortality the per cent of cures decreases in an inverse ratio.

Of the precancerous or very early cancers of the tongue Butlin cites the following five conditions as the most characteristic and important: "(1) A little plaque-like, hard sore, smooth and polished, but neither ulcerated nor excoriated. (2) The transformation or replacement of a simple ulcer by a cancerous ulcer, which only differs from the simple ulcer by feeling a very little stiffer and a very little firmer. (3) The transformation of an entire plaque of leucoplacia into a plaque of cancer. The difference is marked by very slight thickening, a denser white, furrowing and fissuring in various directions, but without excoriation or ulceration. (4) The transformation of one small area of a leucoplacia tongue into cancer, only marked at first by very slight and superficial hardening. (5) A white, warty growth or a compound wart, neither broken nor ulcerated, and feeling at first as if it were fixed to the mucous membrane and quite superficial." The most frequent form is the papilloma especially one growing in a previously existing leucoplacia, the most infrequent is a submucous nodule.

As to the use of the term "precancerous" there is still lack of agreement. Butlin formerly regarded the above-described lesions as precancerous but later wrote that he doubted if any of them were really precancerous and not actual early cancers. Bloodgood still retains the term precancerous and also calls the papillomatous growths malignant warts. After all, this distinction is of little magnitude, the important thing being early and complete elimination of all conditions that suggest the possibility of cancer.

The excision, even for microscopic examination, should be made clean and wide, never through the lesion when avoidable. Some employ the actual cautery, others follow Butlin's dictum, avoiding it.

The microscopical diagnosis of doubtful cases should come from experienced pathologists only, as the round-cell infiltration at the base may be very misleading. All really doubtful cases should be given the benefit of the doubt and treated as cancer. A prolonged try-out of the "therapeutic test" is usually equivalent to a death warrant.

The desire to eliminate the precancerous factors should not lead one into the active local treatment of uncomplicated leucoplacia except possibly where it is so small as to permit of complete excision. Almost all observers are agreed that irritation of a leucoplacia is only too apt to precipitate cancer. The most dangerous of all seems to be the use of silver nitrate. Abbe alone recommends the use of radium but cancer has followed this treatment.

The characteristics of a fully developed cancer are persistency of the lesion and usually, very early ulceration, the rolled edge of the latter never being really undermined by the ulceration. The induration is usually very firm, is sometimes relatively soft and more rarely presents the characteristics of scirrhous. Some are atrophic and others are medullary. Later there is foul discharge, hæmorrhage, cachexia, and involvement of the lymph-nodes. Pain is a factor sooner or later in most cases; it may precede the appearance of any observable lesion or it may come late, and it may be in the lesion, in the ear, or in the vertex. Sooner or later the lymphatics become involved, the exact time being uncertain, and the disease may lay dormant in the nodes for long periods, even years. A carcinoma may remain unobserved; usually a fissure under the side of the tongue, the first noticed evidence being the lymphatic tumor.

With the exception to be presently noted, recent literature suggests no worth-while departure from the usages that were summarized by Butlin when he reported his 200 cases. These principles of treatment are as follows:

Early and wide local excision, a complete block removal of all of the lymphatics of the neck on the side of the cancer including the submaxillary and the lower part of the parotid glands. When the cancer crosses the midline or when it is situated upon the base of the tongue the lymphatics on both sides are to be removed. Some writers have suggested the removal of selected lymphatic groups according to the location of the primary growth, but this is condemned by most of the more experienced. Hochenegg, who practiced limited lymphatic removal, could in 1906 claim only 14 per cent of cures, which is much below the best results of that time. The operations on the tongue and on the neck should be done at different times. Unless the floor of the mouth is directly involved it should not be invaded or removed. Cancer-cells disseminate farther and more rapidly in the muscles of the tongue than in the mucosa or connective tissue. The excision of the primary

growth should be made with a knife, scissors, or cautery. The tongue tissues should be removed from 2 to 2.5 cm. beyond the visible or palpable growth, but in a one-sided cancer it is usually unnecessary to remove both halves of the tongue, the median septum for a long time forming an efficient barrier to the spread of the disease; Heidenhain removed both halves in all cases. Aspiration is to be rigidly guarded against, most experienced operators anesthetizing through a laryngotomy wound. Lately intratracheal anesthesia is replacing this, and local anesthesia is being used by some. Infiltration of the lingual nerve with alcohol has been used to control pain, but this will not affect pain impulses traveling along the glossopharyngeal. Preliminary ligation of the lingual artery is unnecessary. Blood-good has recently made the following suggestions:

1. That heretofore the tongue removals have been too extensive.

2. That leaving the floor of the mouth intact predisposes to recurrence.

3. That the removal should be done with the actual cautery.

4. That leaving the jaw bone on the affected side after the removal of the floor, adds to the operative mortality. Hitherto these have not all had the support of the most experienced, therefore a discussion of them is not out of place:

1. Previous extensive intra-oral operations. Almost all previous writers have warned against not removing sufficient intra-oral tissue, most recurrences being in the mouth, and Lenthal Chealle has demonstrated cancer-cells in the muscles of the tongue far beyond the apparent site of invasion. Butlin, however, was more conservative of the mouth tissues than most others and cites that 102 out of 200 of his cases either died of recurrence at some other site or remained alive and well for three years without mouth recurrence; and in 33 of these local recurrences the disease was so extensive at the time of operation as to preclude wider excision. This still leaves 65 out of 98 cases that had local recurrence in which a more extensive local operation might possibly have saved some.

2. The necessity for the removal of the floor of the mouth in all cases. Butlin answered this in the negative stating that he had already done this and that in only two of his cases could it have been reasonably supposed that recurrence was due to the disease in the tissues that were left between the primary mouth operation and the neck dissection. In some of the Kocher-Langenbeck operations the floor, the intra-oral growth, and the neck glands are removed in one piece.

3. The use of the cautery. Butlin has been the strongest opponent to this, believing that hard scars predispose to cancer. Kocher has always favored cutting with the actual cautery and this is the oldest form of operation.

4. Leaving the jaw on the affected side increases the operative mortality. Almost all series of operated cases have hitherto shown that removal of a part of the jaw increases the post-operative mortality about 300 per cent over the intra-oral operation. In support of his contention, Bloodgood states that he has operated upon 24 cases in the past five years by his newer methods without a post-operative death and only one recurrence, the latter in a secondary case—a striking record—and if borne out by a larger series over a longer period will leave no doubt of the correctness of Bloodgood's ideas.

Kuster reports a case thirty-two years old, inoperable, which after ligation of both the external carotids and X-ray treatment was so improved as to render radical operation possible.

Untreated cancer of the tongue ordinarily will survive a little over a year. The results of operation have been variously estimated but with the exception of the last series from Johns Hopkins, Butlin's results are by far the best. In 168 traced cases 33.92 per cent survived for periods varying from three to twenty-two years, with an operative death-rate in all cases of 10 per cent. In the latter half of his whole series his percentage of cures rose to 41.55 per cent. The more recent Johns Hopkins series show 50 per cent cures but the number of cases is very much smaller and the reviewer could not make out upon just what basis this 50 per cent cures for the past five years is figured. Many series show results far inferior to these, the main determining factor being the age of the cancer when treatment is instituted. There is reason to hope that in a few years the per cent of cures will be nearer to 100 than 50 per cent and this will be due to education rather than to operating technique.

SARCOMA OF THE TONGUE

The first report of a case of sarcoma of the tongue was by Fiedler in 1864. In 1911 Baustrop collected 58 cases from the literature but says only 39 are authentic and of this 39 there were only 4 certain recoveries. In January, 1915, Coughlin reported 2 cases with 58 collected from the literature, with undoubted glandular involvement in 40.5 per cent of the cases.

It is difficult clinically and sometimes pathologically to differentiate between sarcoma and leukic or tuberculous lesions and chronic glossitis.

No age seems to be favored, three were reported as congenital and according to Coughlin, 27.4 per cent of the cases were in the thirties.

It appears more frequently on the dorsum and borders of the tongue and the types reported were round-cell, predominating, spindle-cell, lymphosarcoma, fibrosarcoma, angiosarcoma, myxosarcoma, polymorphonuclear sarcoma, and some others simply designated as sarcoma.

The treatment is operative, similar to the treatment of carcinoma with possibly less extensive local removal.

Recurrence is reported in from eight days to three and one-half years, being local, in the glands, or both.

BENIGN TUMORS OF THE TONGUE

Of benign tumors of the tongue and floor of the mouth, simple cysts, blood-cysts, polyps, angiomata, lymphangiomata, papillomata, chondromata, adenomata, fibromata, plasmomata, neurofibromata, osteomata, macroglossia, lipomata, fibrolipomata, endotheliomata, lingual thyroids, and amyloid tumors are reported. Except for the angiomata, these are of rare occurrence.

Before the first half of the nineteenth century all tumors of the floor of the mouth were called ranulae; Hipple pointed out the true pathology. Dermoids occur in the midline and laterally.

TUMORS OF THE PALATE, TONSILS, AND PHARYNX

Tumors of the palate, tonsils, and pharynx are comparatively rare and, with the exception of the palate adenomata and a somewhat common exostosis in the center of the hard palate, are usually malignant. The palate adenomata occur in young people and are histologically identical with the mixed tumors of the salivary glands and are clinically subject to the same changes. They may remain stationary for years, only to take on extreme malignancy. Ulceration is not necessarily a sign of malignant change for it may occur from mechanical irritation.

Teratomata, fibromata, sarcomata, and carcinomata may also be found in the palate.

Tumors of the tonsils and pharynx are usually malignant and of extreme virulence.

Wood reviews the literature of tumors of the tonsil from 1884 to 1909, finding only 2 cases of sarcoma; Matthews reports 22 cases from the Mayo Clinic; 11 sarcomata and 11 carcinomata, one of which arose on a gumma.

Various operations from tonsillectomy to the most radical procedures gave about uniformly bad results. Apparent disappearance of pharynx-

geal tumors have been reported from the use of radium, and Coley's toxins have had a palliative effect on some sarcomata. Coley reports one adenosarcoma of the soft palate rendered operable by the use of the toxins. Dawbarn's starvation treatment has also been used with apparently beneficial effect in some cases.

Of fibromata, Manciola collected in the literature 65 cases between 1853 and 1902 and Brunetti collected 22 in the following seven years. Kelsey reports one osteofibroma.

CARCINOMA OF THE LIP

The early history of surgery of carcinoma of the lip is difficult to trace. It comes down to us mainly in two forms of treatment: cauterization with heat or with various cancer pastes and plasters, and the "V" excision, this latter being the much more recent procedure. The excision of glands for carcinoma of the lip became an established procedure even later than for carcinoma of the tongue because of the apparently high percentage of cures that resulted from purely local treatment. Whether this apparent comparative immunity of the lymphatics in lip carcinoma is as high as the records of purely local operation would lead us to believe, is not certain.

In cancer of the lip the disease may be dormant in the lymph-nodes for years after the primary sore is cured and then become active.

Local excisions are still being practiced, though this is largely through ignorance of the more recently established facts, but in spite of this the results of local operation for early growths are extremely good.

More recently the use of radium and the X-ray have come into vogue. Reliance upon them in operable cases is a backward step for they are hardly effectual when the glands are involved.

As everywhere else late and incomplete treatment are responsible for the failures and there is no part of the body where carcinoma surgery should give more promise.

A lesion may exist for a few months to years before it becomes microscopically malignant, but any wart as large as the tip of the index-finger is almost certainly malignant. The history of every case of fully developed cancer of the lip reveals the fact that at some period during its presence it presented characteristics that were identical with lesions known to be benign, and therefore Bloodgood concludes that there was a precancerous stage in each, a time when it was a purely local disease.

Any sort of an irritation may precede the clinical development: smoker's burn, trauma, and

fever blisters being the more common in the order named. Leucoplacia is present in about half the cases and seborrhea is supposed to be a predisposing factor. From 15 to 20 per cent of cases are inoperable when presented for treatment.

It occurs in increasing ratio from twenty years on but may occur before. Fifty-five to sixty years is the favorite age and as a rule the younger the patient the more malignant the growth. It is much more frequent on the lower lip than on the upper. On the lower lip the proportion of prickle or cubocellular cancers to the basal-cell cancers is between fifty and seventy-five to one, on the upper lip it is three to one. Its occurrence is six times as frequent laterally as in the midline; 90 per cent are in men and it is rare in the negro. Very rarely the skin surrounding develops a cancerous eczema.

Steiner found that 84 per cent of recurrences and 71 per cent of primary cases presented themselves within a year after the appearance of the growth, while in 76 per cent of the primary cases ulceration was present.

Von Bergmann reports a case of spontaneous disappearance of epithelioma of the lip with later relapse, and the reviewer observed another case of spontaneous disappearance of what was most probably an epithelioma of the lip, with later a development of squamous carcinoma in a submaxillary lymph-node, without recurrence of the primary lesion.

Bloodgood found that in cases in which a primary clean local operation was done the lymph-nodes were found to be demonstrably cancerous in 37 per cent of the cases, but in cases that had been subjected to incomplete operation or ineffective treatment the lymph-nodes were microscopically cancerous in 60 per cent.

The glands may be definitely involved a few weeks after the appearance of the initial lesion or they have been found to be free from demonstrable infection after eight months. Cases are reported in which the glands have become clinically cancerous at varying periods up to eight years after the successful removal of the primary growth. In a few cases the metastasis was discovered before the primary growth was noticed. In view of these facts most surgeons will advise at least a regional removal of lymph-nodes in all carcinomata of the lip but Bloodgood contends that in lesions that are clinically benign, even though the microscope shows very early malignant changes, there is no need of gland removal.

The block excision of all lymph-bearing tissue

of one or both sides of the neck is needed only exceptionally. As a rule the removal of one or several groups of glands, as the submental, submaxillary, and upper deep cervicals of the affected side, is sufficient. In advanced cases the most radical operation may be insufficient. The subcutaneous lymph streams are not supposed to cross the midline, while the cutaneous ones do. This has been taken as a basis in deciding as to whether the lymph-nodes of one or both sides are to be removed. If the growth involves the angle of the mouth the buccal group should be removed.

Some operators remove the platysma with the submental and submaxillary nodes, while others leave it on account of the superficial position of one submental node. Bloodgood removes the anterior bellies of the digastric muscles, while others are content to dissect under them. In removing the submaxillary group the submaxillary gland should always be included.

The V-excision is most commonly practiced, especially for the smaller growths, though square excisions or excisions diverging toward the chin to include the lymphatic trunks have been recommended even for the smaller lesions. In advanced growths the free use of the actual cautery is coming more into favor, not only on the face but in the submental and submaxillary regions, after dissecting out adherent glands. After extensive cauterization, repair is made when the slough separates and inflammation subsides.

After the classic excision, if the defect is not too great, repair is made by simply drawing the borders of the wound together. In larger excisions, repair is made by flaps from the cheek or neck; where possible the mucous lining as well as the cutaneous surface should be restored.

Bloodgood in a study of 20 spino- or cubo-cellular carcinomata of the lip divides them surgically into two groups: those in which the local growth was removed cleanly at one operation without previous treatment or irritation, which he calls primary cases, and those in which an incomplete operation was done or in which a piece was removed for microscopical examination or in which some form of ineffectual treatment was tried before its complete removal; these latter he classes as secondary cases. His results were as follows: primary cases operated upon without removal of the glands, cures, 61 per cent; secondary cases operated upon without removal of the glands, 20 per cent; primary cases operated upon with removal of glands found to be negative, cures, 95 per cent; secondary cases operated upon with removal of the glands found to be negative, cures,

60 per cent; primary cases operated upon with removal of infected glands, cures, 50 per cent; secondary cases operated upon with removal of infected glands, cures, 20 per cent.

Where the jaws have become involved hope of cure is almost nil. Local recurrence is more likely with medium-sized ulcers with close excision than in the larger ones where wide excision is done.

Steiner had 70.1 per cent cures for a three-year period and 69.6 per cent for a five-year period, with 10 per cent operated upon for a recurrence.

Bartsch estimates the average length of life in cancer of the lip at three and a half years and permanent cures at 35 per cent.

The Central Committee of Berlin for the combating of cancer estimates cures at 80 per cent.

In recurrent cases cures are placed at about 10 per cent while two-thirds of the recurrent cases die within a year.

Sarcoma of the lip probably differs from sarcoma of these sites only in its rarity.

Landon reports one case of sarcoma of the lip, refers to 2 cases in one textbook and 9 additional cases in the literature, only 3 of which proved to be primary sarcoma of the lip.

Markley says that the only textbook referring to sarcoma of the lip is the Duplay and Reclus "Surgery" of 1898. He finds three reported cases in the literature and cites one of his own.

Langston reports one case.

All of the above cases were of the lower lip, one causing enlargement of the cervical nodes.

CARCINOMA OF JAW AND CHEEK

Rohr states that suppuration of the antrum is a predisposing factor in carcinoma of the upper jaw.

About the throat, nose, and its sinuses, where ciliated epithelium is found, this variety is first replaced by squamous epithelium before it shows recognized signs of malignancy. Basal-cell carcinoma may develop in the antrum; it may be presumed that it is rare. Unless due to an extension from the lips or cheeks, carcinoma of the jaw is almost exclusively a disease of elderly persons. It can arise only from epithelium and in most instances comes primarily from the mucous covering of the gums or the lining of the antrum. Schlatter cites one case in his practice in which the tumor arose within the body of the lower jaw, apparently metastatic from a cancer of the breast that had been removed three and a half years previously, and one from the upper jaw from the same cause. Balloch reports a basal-cell tumor of the lower jaw with removal of the left half and

part of the right half of the lower jaw after ligation of the carotids. The common site of primary cancer of the upper jaw is within the antrum.

Of the tumors which arise within the mouth, most of them seem to be in connection with dental or mechanical irritations. Leucoplacia is responsible for some, and in this connection smoking must be regarded as a factor. In a number of cases the disease is an extension from the lip or cheek. Broadly, there are two clinical types of carcinoma of the jaws: the hard, ulcerating type, which usually appears on the lower jaw; and the soft, medullary carcinoma, which is found in the antrum and upon the oral surface of the upper jaw. Either may arise as papillomata, as they were first called by Kramer in 1847, while Hopman added the designation "durum." Von Bungner called them *verruca cornea*. Silz states that hard papillomata of the lower jaw are rarer than the soft variety and Hopman and von Bungner maintain that they are benign. They are true, hard, cauliflower-like tumors on the boundary line between benign and malignant ones. The symptoms of the hard and soft types of cancer differ materially. The hard, ulcerating tumor grows more slowly, and in the earlier stage causes no pain; the induration and ulceration invade the neighboring surfaces much more rapidly than the deep tissues; the induration of this type is usually of a hardness that is unmistakable.

When seen upon the oral surface, the medullary carcinoma is usually very soft and is first noticed as a small papule which may bleed easily. As it extends it may take on a cauliflower appearance. It readily extends both on the surface and into the antrum, but does not ulcerate early. In tumors arising in the antrum or nasal cavity pain is an early and almost constant symptom. This may be localized in the form of a toothache, or diffused pain over the distribution of the fifth cranial nerve. As the tumor enlarges, there are symptoms of obstruction of the nasal fossa and of the nasal ducts. The cheek becomes prominent; when the external bony wall is perforated the tumor may be felt in the soft tissues of the cheek. The skin may become discolored, but rarely ulcerates. The tumor may fungate into the mouth. These tumors usually invade the orbit, causing exophthalmos, with or without impairment of vision.

Carcinoma of the lower jaw causes earlier evidence of involvement of the lymph-nodes than does the carcinoma of the upper jaw. This may be due to the fact that most of the lymphatics leading from the upper jaw empty into the inter-

nal maxillary and retropharyngeal nodes which are not palpable.

The malignancy of medullary carcinoma when at all advanced is always evident from the rapidity and impartiality with which it invades all tissue with the exception of the teeth and eye-ball.

The prognosis of carcinoma of the body or surface of the maxilla is usually considered to be very bad. König believes in extremely radical operation. Of 48 cases, 19 died immediately, 8 are in good condition or died of intercurrent diseases ten to twenty-six years after operation, 2 operations are just recent, and all the others died of recurrences. The medullary tumor which attacks the maxilla, rapidly invades the neighboring tissues, and the lymphatics are usually out of the reach of surgery. Quénu reports one in which the anterior wall of the maxillary sinus was destroyed and the soft tissues of the face invaded, yet has been free from recurrence for ten years. With the hard cancer of the surface of the lower jaw the prognosis is much better. If seen early, it may be rather favorable after a proper operation.

The treatment is free excision of the primary growth and, if the growth is on the alveolar surface of the upper jaw or on the lower jaw, excision of all of the lymph-nodes of that side or both sides of the neck. The plan of excision of the primary growth should correspond to its location and extent. Carcinoma invades all tissues, and the excision should be planned to include all tissues to the extent of 1.5 to 2 cm. beyond the visible margin of the growth. Cancer of the cheek remains localized longer than cancer of the tongue or floor of the mouth, but tends early to involve the intermaxillary fold. For ulcerated carcinoma of the lower jaw which has apparently not invaded the tooth sockets, it may be well, all things considered, to retain 5 mm. of the lower border of the body of the jaw. Gensoul first made complete removal of the maxilla in 1827. Rabe collected 606 cases of major operations on the upper jaw between 1827 and 1873, with a mortality of 18.4 per cent. That antiseptic surgery had very little influence on the mortality is shown by Kromline who calculated the mortality as 21.5 per cent for 158 total resections in the antiseptic period of 1870 to 1897. König's mortality for excision of the upper jaw is about 30 per cent, Eve's 16.6 per cent, and Kromline, believing the high mortality due to aspiration pneumonia, bronchitis, etc., carried out the suggestion made by Heuter in 1867, doing the operation under a little morphine and suggestive anæsthesia, reducing the mortality to 2.8 per

cent. Percentages on excision of the lower jaw are not given, but Vallas says operations on the maxilla are better borne than those on the mandible, and Faure also thinks they are less serious. Preliminary ligation of the external carotid is favored. Intra-oral operations have been done for removal of both lower and upper jaws but do not give free access. Prosthetic appliances should be inserted early before scar contraction takes place. Intratracheal anesthesia is largely displacing preliminary laryngotomy in these operations.

SARCOMA OF THE JAW

Several varieties of sarcoma occur in connection with the jaws. Including the sarcomatous epulis, sarcoma is the most common variety of tumor of the lower, and next to carcinoma, the most common tumor of the upper jaw. They may be of the spindle, large or small round cell, or the somewhat doubtful alveolar variety, which is, with the exception of the melanotic sarcoma, the most malignant tumor appearing in the mouth; or the growth may be mixed in the character of the cells which compose it. Any of them may contain sufficient fibrous tissue to make this a characteristic of the growth; they may form bone or cartilage. Rarely, melanotic sarcomata of the upper jaw have been observed. Fairbank in a report of 140 collected cases found that most occurred in women, mostly before twenty years, the youngest being in a child of eleven months and it was a melanotic sarcoma.

Sarcomata may arise from the gums, the antrum, the surface periosteum, root membrane, or from the alveoli of the bone. If the sarcoma is in the upper jaw, it must often slough in the antrum. The hard palate and frontal process of the upper jaw are least often involved. Sarcomata arising from the periosteum are usually rather firm in consistency while those arising from within the bone are often very soft. Scudder states that periosteal sarcoma does not arise from the alveolar border, but from the body of the bone. It is often stated that the periosteal varieties are less malignant than those of endosteal origin. This, however, seems not to take into account myeloma, which is a frequent endosteal tumor, and which is only locally malignant.

A sarcomata arising within a tooth socket causes first a loosening, later a loss, of the tooth and is then inclined to fungate from the cavity. The periosteal varieties cause hard, irregular, somewhat fusiform swellings. The myelomata grow within the bone and cause a thinning and often irregular bulging of its walls, but can also cause a thickening of the gum tissue. Certain

of the true sarcomata which grow within the body of the bone cause a thinning and bulging rather than infiltration of its walls, and from personal observation, the writer is certain that they are among the more mildly malignant. In the upper jaw periosteal sarcomata may arise within, or endosteal sarcomata may invade the maxillary antrum, causing at first a thinning and bulging of its walls but later a perforation and involvement of the soft tissues by direct extension. Sarcomata of the mouth may cause enlargement of the lymph nodes, but, with the exception of the lymphosarcomata, more often from septic absorption from the ulcerated surface than from an extension of the disease itself into the lymph-nodes. Sarcomata seldom cause pain, at least in the earlier stages, though they may do so by pressure on nerve-trunks. The diagnosis should always rest upon a microscopical examination, to which it is a safe plan to subject every tumor. The various clinical symptoms which are ascribed to different tumors and different varieties of sarcomata may be misleading in the individual case and if depended upon for a diagnosis may cause unnecessary mutilation or a disastrous delay. We have seen an adenocarcinoma in a girl of twenty years which clinically appeared to be a sarcoma but which had already infected the lymph-nodes. In another case its sarcomatous nature was entirely overlooked because there was little evidence of growth and a very extensive necrosis of one-half the body of the lower jaw. A microscopical examination of some hard granulations which lined the cavity proved its true character. No age is exempt from this disease. Coley attributes acute trauma as a cause in 23 per cent of his 970 cases, which corresponds to the observations of others. Some fungate and ulcerate early, while others attain immense size without ulcerating. In some varieties the growth is rapid from the first, while in others it may be slow or remain in abeyance for years, only to take on a rapid invasive growth at a later period.

With the exception of the myelomata and certain slow-growing, large round-cell varieties, the treatment of all operative tumors is a radical excision, *en masse*, of all involved tissues well into the healthy structures. The lymphosarcomata and some of the others will demand the removal of the lymph-bearing tissue of the regions which drain the infected area. It is not always necessary or advisable to remove a half or whole of the jaw bone, but the excision should be made from 1 to 1.5 centimeters from the tumor all around, regardless of the tissue involved; but, where possible, the lower border of the maxilla

should be preserved. Gilmer has sounded a most timely warning against the indiscriminate excision of the whole jaw for all varieties of sarcoma. Schottländer gives the cures in sarcoma as 50 per cent.

EPULIS

Many writers in their descriptions of epulis follow the literal meaning of the term and include any tumor appearing upon the gums. The most succinct and intelligent description is in a recent paper by Ivy, who describes it as a circumscribed connective-tissue growth from the alveolar ridge covered with normal mucous membrane, except in so far as the latter may undergo secondary ulceration due to pressure necrosis, infection, etc. It may be confounded with papilloma, epithelioma, etc. There are hard and soft epuli. The hard epulis is slow growing, it may be years before increase in size is perceptible; it has a sharp line of demarcation, arises from the surface of the gum, and is slightly darker in color than the normal mucosa. It is a pure fibroma, occasionally myxomatous, and may contain bone. The soft form is usually of rapid growth, arises from the interior of the bone, is dusky red, and may be partially covered by a shell of bone. X-ray may show the bone clearly eroded. These tumors belong to the giant-cell or myeloma type and may contain bone or cartilage.

Confusion has arisen from describing the growth under different names and from describing entirely different growths under the name of epulis.

Giant cells are strong presumptive evidence of non-malignancy even if the tissue appears to be sarcoma.

Tumors of evident endothelial origin with giant cells scattered within the vessels are believed by Whitman and Ivy to be another and malignant group of giant-cell tumors. The unfortunate term sarcoma has led to needless resections. Kühner refers to 90 cases of epulis in the Tübingen Clinic; the majority occurred between ten and forty years, and two-thirds were in women. Of 79 patients whose tumors were removed in the past thirty-five years, 72 were permanently cured, 2 died from recurrence, and 5 others were cured by a secondary operation.

CYSTIC TUMORS OF THE JAWS AND TUMORS OF DENTAL ORIGIN

In 1872, Magitot published the first important work on cystic odontomata and attributed their origin to the development of the embryonic dental tissue.

The clinically distinct type of cyst found in the jaws is usually considered in its origin to be

related to the dental strand or to a developing tooth.

The true dental cyst, which is found in relation to the roots of usually dead teeth, may vary in size from minute sacs to the size of a lemon; is always supposed to have both a fibrous capsule and an epithelial lining, although the latter may, in the older cysts, become destroyed by pressure or suppuration. Oppikoffer reports 19 of these root-cysts, in which, microscopically, he distinguished three layers of the capsule, one fibrous, one granular, and one epithelial. They are supposed to arise from dental rests, remains of the dental strand which are found in various parts of the jaw, and the formation of the cyst is dependent upon irritation. Malassez in 1885 described these dental rests. The term dental cyst, on account of the loose way in which it has been applied, has been discarded by some, including New, but is retained by others and when properly used is expressive of the condition.

The term dentigerous cyst, also objected to by some writers, properly includes cysts that contain a partially developed tooth, the cyst wall supposedly consisting of the sac of a permanent tooth which has become thickened and which the tooth has failed to pierce. Depending upon the thickness of the sac and a possibly bony content Bland-Sutton has subdivided them into follicular odontoma, fibrous odontoma, and cementoma. The contained tooth may be well developed or represented only by a denticle. Westmorland reports 43 cases of follicular odontoma, all except one being in negroes.

The cystic adamantinoma, multilocular cystic tumors, and epithelial cystic tumors are terms applied to a multilocular cystic mass appearing usually in the posterior part of the lower jaw, sometimes in the upper, at an average age of thirty-three years. They are usually described as containing epithelium, supposedly arising from the enamel organ, but Bland-Sutton and some others regard them as endothelial in origin. They are supposed to be mildly malignant and a few reported in literature have caused metastases in the glands of the neck.

The dental cysts may appear at any age, dentigerous cysts after the second dentition, and the cystic adamantinomata usually at middle life. The most recent inclusive review on these cysts is by New.

The term odontoma has been used to describe almost any sort of tumor or cyst of dental origin, and dentigerous cysts are usually placed with them. Gilmer objects to this broad classification and would exclude dentigerous cysts of all

varieties. Deformed teeth and masses of cementum that are sometimes found about the roots of teeth, Bland-Sutton and Boca describe as radicular odontoma. Gilmer would include under the term of odontomata only nests of aberrant tooth forms, united by cement but enclosed in a fibrous capsule, similar masses held together by granular calcific matter that resembles cement, and those classified by Bland-Sutton as composite odontoma. All of these latter forms are supposed to develop independent of the normal teeth, a full quota being present in the jaws.

All of these tumors and cysts develop in the bone and are covered by a thin expansion of bone and all but the cystic adamantinomatous may be lifted cleanly out of their beds. They are normally covered by smooth mucous membrane but may become infected and ulcerate. They have frequently been mistaken for tumors of the jaw.

There is much discussion as to the academic classification of these various forms but with the exception of the cystic adamantinomatous there is considerable unanimity as to their nature and origin.

Attached to the border of the gum in the incisor region may be found at birth one or more purplish tumors, the size of a tooth crown, which resemble the pedunculated tooth buds often seen near a cleft palate. Kaempler describes them as odontoblastomata and believes they differ from every other form of tumor arising from the mesoblastic dental process or dental organ and that dentition may or may not follow. He finds eight in the literature and believes them rare. It is possible that these tumors are of more frequent occurrence as they are easily detached and often lost without detection. The dental ridge may fail to become inert after the proper number of teeth have been formed and go on producing them indefinitely. One case has been reported where upward of one hundred denticles have been repeatedly removed from a jaw. The reviewer had one case where there were ten well-formed teeth in the molar region on one side of the maxilla.

SALIVARY GLAND TUMORS

Tumors of the salivary glands are of extreme interest, both on account of the peculiar behavior of some and because, in spite of an immense amount of work that has been done on them, the exact nature of the largest group, the so-called "mixed tumors," is still a matter of dispute.

Congenital enlargement of the sublingual and of Blandin's glands has been reported.

Lipomata, fibromata, angiomata, lymphangiomata, and neuromata of the salivary glands have all been observed, but are of rare occurrence. They present no special symptoms peculiar to this situation and are to be treated as are simple tumors elsewhere. Dermoids have occurred in or near the salivary glands.

Heiocke gives an exhaustive bibliography of 16 titles on lipoma, 22 on angio, 6 on lymph, angio, 299 on mixed tumors, 84 on carcino, 11 on sarcoma, 11 on melanoma; with 45 illustrations of clinical cases and histologic pictures.

Obstruction cysts may occur within a salivary gland, due to the blocking of one of the smaller ducts, when the accumulation of secretion and epithelial detritus causes a cyst filled with a glary mucous-like fluid. This is a somewhat common occurrence in the sublingual gland, which constitutes one form of ranula, but is extremely rare in the other two glands. A cyst of this kind grows slowly. If obstruction occurs in a small duct leading from a lobule in the intra-oral part of the submaxillary gland, this cyst would also constitute a ranula; but if the obstruction was somewhere in the body of the gland it would bulge beneath the jaw.

Salivary gland cysts, especially of the submaxillary gland, may become of great size. Street and Keen each removed one cyst weighing seven pounds and Hays reports one weighing forty-seven pounds. Salivary cysts of the parotid are rare; Despres published the first case in 1868, in 1893 Kirmisson added one, and Pietri, who covers the whole literature of the subject, presents another. They are lined with cylindrical or stratified epithelium. Walker reports a hydatid cyst of the submaxillary gland.

Inflammatory tumor is mentioned here only on account of its clinical resemblance to a tumor, but a chronic inflammatory mass with little inclination to spontaneous recession and Mikulicz' disease is probably also not a true tumor. The latter is characterized by a symmetrical somewhat elastic tumor of the salivary or lacrimal glands and the tonsils may share in the process. It runs a chronic, benign, non-inflammatory course with occasional fluctuations in the size of the tumor. All but Manelli agree with Mikulicz as to the histology which presents a lymphatic proliferation with pressure destruction of the gland cells, but the term like "Hodgkins," may be one of convenience. Carl Fischer has recently given a good description with a report of cases.

The most interesting of the salivary gland tumors is the so-called "mixed tumor" which is most common in the parotid, appears in the sub-

maxillary gland, rarely in the sublingual and lachrymal glands, in the palate, lips, and tonsils. They occur about nine times more frequently in the parotid than in the submaxillary glands. Sturgis, quoting Wood, found that in 59 cases of mixed tumors, 4 were in the lip, 2 in the pharynx, 2 in the neck, 1 in the cheek, and 1 in the palate.

These tumors may be congenital or may appear late in life, but they most often appear between the ages of fifteen and thirty years and have a peculiar preference for the right side. They may arise within the substance of the gland or may be connected with it by a stalk, but they are supposed to always arise within the gland capsule. Parotid tumors may arise in front in the gland in the cheek, in the line of the mouth slit. Until they acquire or show malignant character, they are encapsulated, and at this time, unless situated very deep in the parotid, are easily removed. The gland may be found compressed and wrapped around a large tumor. When not malignant, they are always sharply defined but may be very lobulated. At first they are usually firm but later may be cystic. In the submaxillary gland they usually grow toward the neck, but in the parotid the direction of their growth will depend somewhat upon their original starting point; a deep tumor may grow toward the pharynx. After malignancy once becomes evident they infiltrate rapidly and may ulcerate through the skin. Death from malignant mixed tumors, whether malignant from the first or acquired later, usually results in a few months. Death results more frequently from the local disturbances—such as dyspnoea, starvation, hæmorrhage, or pneumonia—than from metastases of the lungs and other organs.

The most common clinical characteristic is the fact that for a long time after these tumors are noticed they may grow slowly and then remain stationary for years, only to take on rapid and most malignant growth. With this sudden, rapid growth may come metastasis of the lungs and sometimes of the lymph-nodes. A few grow slowly but continuously without any period of apparent rest. They are often the size of a nut or small orange but may attain the size of a man's head. When these tumors have persisted for a long time, especially in older people, they may become cystic. These cysts may reach an immense size, they may be tender in spots or may be painful, but are not necessarily so. When situated in the parotid, they often affect the seventh nerve. Salivation is sometimes a very prominent symptom. There is a most volumi-

nous recent literature on this tumor, mostly French and German.

The histologic picture is most complex; Bland-Sutton, who calls them parotid sarcomata, says, "It is not unusual, in sections from parotid sarcoma, to meet with spindle cells, cartilage, myxomatous tissue, glandular acini, and fibrous tissue within an area of two centimeters square." Butlin, Volkmann, Kauffmann, and Nasse believe them to be of endothelial origin and that the cartilage-like substance is a product of the endothelial cells.

Delanglade and Peyron describe a case of glandular epithelioma of the parotid with epidermoid evolution developing in the adult gland. This group of tumors was first described by Krompecher, Alezais, and Peyron. In his original work Krompecher, among 20 tumors of the parotid, describes only one of this group; but the examination of a number of tumors by Alezais shows that this proportion is too small. Poujol developed the idea of this evolution toward the epidermoid type which seemed to him to be in conformity with general anatomy. Since then his conclusions have been forgotten or passed over in silence by a series of authors who have preferred the ingenious hypothesis of Wilms' school to rigorous observation of histologic facts. Hinsberg believes that the connective-tissue elements are derived from Reichert's cartilage or from the periosteum of the lower jaw. Aberrant periosteum has been found. Paget, Verneuil, Planteau, Perachaud, and Paillet believe that the connective-tissue stroma originates from interstitial connective tissue and that the epithelial tissue is of glandular origin. A connective-tissue origin has also been attributed to the supposedly epithelial elements, epithelial appearance of cartilagenous cells (Kauffmann), endothelial cells covering the epithelium and derived either from the endothelium of the blood-vessels or the lymphatics (Trolestro, Volkmann, Curtis and Phocas, Bosc and Jeanbrau, and Tonarelli). Some authors attribute an embryonic origin to these epithelial elements; according to Hinsberg they are derived from embryonic glandular tubes that were not utilized in the course of development of the gland. Pitance, Wilms, and Massabuau have admitted this origin; Cuneo and Veau also believe them to be of embryonic origin but consider them brachiomata, and this is also the opinion of Vignard, Mouriquand, Fredet, and Chevassu.

Wilms' theory is that the tumors contain fully developed tissue and embryonic tissue, the flat epithelium being derived from the cavity of the

mouth or orbit, the mixed tumor elements developing from embryonal nests of epithelium and mesenchyme which have been latent. The development of simple or complicated tumors depend upon the rate of growth and character of the elements.

Massabau gives his conclusions as follows: "Mixed tumors of the salivary glands are made up of two kinds of tissue, connective and epithelial. The epithelial tissue presents two different aspects: (1) Masses of pavement epithelium of the malpighian type, the development of which may sometimes predominate and lead to the formation of veritable pavement epitheliomata inside the parotid and independent of the gland. The degeneration of the epithelial cells of the septa leads to the formation of pseudoglandular tubes of variable forms which the advocates of the epithelioglandular theory have often taken for true acinous tubes. (2) The epithelial tissue also presents itself in the form of true glandular tubes, constituting true, small, acinous groups in the form of lobules in the midst of the tumor or leading to the formation of adenomatous tubes varying in size. Epithelial formations are also found that reproduce the exact structure of the excretory canals of the salivary glands."

These two kinds of epithelial formations, pavement epithelium and glandular epithelium, are very intimately connected in these mixed tumors; there are points where they seem to be interlaced and confused, where one seems to be derived from the other and where a malpighian proliferation seems to be taking its point of departure from a normal or adenomatous glandular tube. But when we examine the relation of the polymorphous connective-tissue stroma or masses of pavement epithelium, we find that there is no continuity between the two kinds of formations but only the contiguity by reciprocal penetration and that we can often follow to its ultimate limits of proliferation the distinction between the elements of the epithelial type and of the connective-tissue type. Neither the epithelial glandular theory nor the endothelial theory are capable of explaining the histological structure of these complex tumors of the salivary gland. The branchial theory does not give a perfect explanation of the different localizations of these mixed tumors (on the lips, the cheek, and the veil of the palate), and especially does not explain the presence in these tumors of epithelial formations of normal or adenomatous glandular type. The only theory that perfectly explains these tumors is that which attributes their origin to ectomesodermic remains of the embryonic bud destined to

form the glands themselves, it is only one special fact in the history of the development of mixed tumors in glandular organs. It explains the neoformation of pavement epithelium as well as of normal or adenomatous glandular epithelium, the primitive ectoderm of the buccal region leading in these tumors to the differentiation toward which it evolves normally. It explains perfectly the intimate intermingling of the two kinds of epithelial proliferations. It does not need to invoke, as does the endothelial theory, the idea of cellular metaplasia to explain the development of the polymorphous connective-tissue stroma of these tumors.

The treatment of parotid tumors that are clinically benign is removal; the seventh cranial nerve should be preserved.

Heineke estimates the frequency of benign recurrences to be 30 to 40 per cent. Tixier reports one success after the third operation. Küttner puts the malignant transformation at 28.7 per cent; Erich thinks this too high, while Wood puts it at 25 per cent. Butlin believes paralysis of the seventh nerve to be one evidence of malignancy, while sudden growth is also suggestive.

The average age at which parotid tumors come to operation is eight years. When malignancy develops complete extirpation should be practiced, including the lymph-nodes. The parotid gland cannot be completely removed without at least partial resection of the ramus. When the growth has gone beyond the capsule of the gland there is little hope of cure.

A number of cases of carcinoma of the salivary glands, of the scirrhous and medullary type, are reported. Hendon up to 1909 collected 474 cases and reports 5 of his own. Tourneux and Glinesty believe that primary epithelioma of the submaxillary gland is rare. Chevassu in 1910 collected 6 cases, and Jacques reports a case of cancer developing in an old tubercular infection of the parotid fossa.

Cases diagnosed as adenomata, peri-endotheliomata, cylindromata, myxo-endotheliomata, and cystic adenomata have been reported, but considering the complicated character of the mixed tumor and the lack of agreement as to its nature it is probable that these various tumors should be classed with them.

Lambret and Pelissier, in reporting a case of adenoma of the parotid, state that Broca published the first case in 1875 and that these adenomata are of rare occurrence. Nasse reported four cases in 1892; Lexer, Ribbert, and Lecene have also described cases. Volkmann denies the existence of this tumor.

If one does not accept Bland-Sutton's contention that mixed tumors of the parotid are sarcoma then sarcoma of the parotid must be considered very rare. Alhaque, in reporting a case of periepithelioma of the parotid, states that similar tumors have been described by Waldgen as angiosarcoma; by Pwetsky as plexisarcinoma, by Bozzolo and Bizzozero as alveolar endotheliosarcoma, by Billroth as alveolar sarcoma, by Sattler as carcinosarcoma, by Robin as epithelioma, by Hanseman as endotheliocarcinoma, by Virchow as psammoma, and by Henle as cylindroma.

THE RADIUM TREATMENT OF MOUTH TUMORS

In view of the special interest that radiation treatment has aroused both in the minds of the profession and the laity, abstracts from some of the leading papers on this treatment of buccal growths are here appended.

A report of the work carried out at the Radium Institute, London, from January 1 to December 1, 1914, shows that epitheliomata of the buccal, lingual, and pharyngeal mucous membranes are usually refractory, but the new method of burying a radium tube within the nodule has given encouraging results in cancer of the tongue. The best results in sarcoma are those of the tonsil and postnasal space. The results in naevi are good if blanching is accomplished with little pressure, while rodent ulcer is the disease which gives the best response to radium treatment.

The report from the Royal Infirmary at Edinburgh is practically similar to the foregoing, giving the possible cause of failure as the difficulty of administering a sufficient dose in such positions.

Abbe says that radium is the only remedy for leucoplacia and a specific for giant-cell sarcoma, while Pfahler believes the best results are given by a combined treatment of excision or electrothermic coagulation together with röntgen therapy.

Blumenthal of Berlin reports favorable action of the X-ray after intravenous injections of atoxyl, and Seilmann obtained a certain amount of amelioration in a carcinoma of the tongue.

Great hopes were entertained at first of röntgen rays and then of radium, but both failed until Dominici devised his technique for the use of ultrapenetrating rays. Some very superficial cancers disappeared after the application of rays to the surface but those which infiltrated the muscle were refractory. Then Dominici and DeMartel adopted the plan of introducing a radium carrier into the tumor for about twenty-four hours. One case of cancerous ulcer of the posterior half of the border of the tongue appeared

to be completely cured after one application. Several cancers treated thus have improved materially; the infiltrated tissues have become supple, and hæmorrhage and pain have disappeared. In very extensive cases there is considerable oedema that may interfere with the respirations, and the patient should be warned of this possibility.

Barcat says that certain tumors of the floor of the mouth toward the anterior part of the base of the tongue may be gradually absorbed under the use of the Dominici tubes; this treatment is accompanied however by a very painful radium dermatitis. It is therefore advisable to combine the radium treatment of these cancers with surgery. This may be done by performing the operation first and then giving radium treatment, or a tunnel may be made between the deep layers of the cancer and the sound tissue, the radium tubes inserted and left in place about forty-eight hours.

Morson gives the effects of radium irradiation as follows:

1. Rapid degeneration of malignant cells near the radium tube.
2. Apparent enlargement of the cell nuclei beyond the degeneration area.
3. Loss of the reproduction function of the cancer-cells. Thrombosis occurs, which cuts off the supply of blood to the tumor. In a few cases decrease in the size of the gland metastases was noticed.

Pusey thinks X-ray treatment as efficacious as any other non-radical treatment and claims that it does not aggravate proliferation and that failure is due to faulty technique.

That radium promotes instead of checking cancer is the conclusion forced upon Rovsing by the tragic experience of whipping small indolent growths into rapid malignancy. He says his failure is not due to faulty technique, as the applications were made according to the approved methods in vogue at Heidelberg. He gives citations of cases. Czerney and Kaan found increased malignancy of tumors of the mucous membrane of the cheek after radium treatment; Wickham and DeGrafs had similar results. Exner had good results from a combination of excochleation and irradiation with medium doses of weakly filtered rays. The cases remained free from recurrence for four years. Schindler thinks radium should be used post-operatively and in inoperable cases, 20 to 30 mg. of radium being sufficient for treatment. If too small doses are given, however, the cancer is stimulated rather than cured. He treated seven cases, in

two of which he did not have large doses at command and used moderate doses; temporary improvement was noticed, but later increased proliferation of the remaining carcinoma cells occurred. In another case he used large doses of strongly filtered rays post-operatively in a case which one surgeon had rejected as inoperable, with freedom from recurrence after more than two years. In another inoperable case he used similar doses with like good results. In a case of carcinomatous ulcer of the mucous membrane of the cheek complete cicatrization was obtained, but later there was a recurrence in the edge of the original lesion. Of three cases irradiated, post-operatively, two of the three recurred, one after two years and one after fifteen months.

Bloodgood says that radium treatment in operable cases causes dangerous delay.

Lazarus' experience in the radium treatment of malignant tumors is based on 600 cases. Even the inoperable tumors of the pharynx which are difficult of access sometimes showed marked improvement after this treatment, while tumors of the mucous membrane of the cheeks and especially tumors of the mucous membrane of the mouth are refractory.

Newcomer gives interesting tables and citations.

A critical review of the literature of radiation for the cure of malignant growths in general and especially those of the mucosa about the mouth convinces the reviewer that, with few exceptions, its application to operable ulcers and tumors is not good surgery. There are certain epitheliomata occurring on the upper part of the face that do not respond well to reasonable excisions, and it is in these that radium has given good results; whether the final outcome from radiation of these will equal that from the free use of the actual cautery remains to be seen. For extensive rodent ulcer it is the best treatment.

Some very good preliminary reports have been made of radiation of connective tissue and epithelial growths of the pharynx, a region particularly inaccessible to surgery. With regard to the oral cavity itself, epithelial growths occurring here have proved particularly refractory to radiation in most reported cases, and its use here seems to offer few advantages over other forms of "medical" treatment in operable growths and all of the disadvantages of delay. It does, however, as a rule help to allay pain; this being at least one good reason for its use in inoperable growths of the mouth cavity proper.

Even the advantage of radiation in combination with excision is not an unequivocal practice on account of the suspicion that has arisen that

the use of the rays may accelerate rather than retard the proliferation of remaining cells after incomplete removal.

One must also make allowance for the enthusiasm of the workers in this field, legitimate enthusiasm without which no investigation can be carried on; and also for the fact that the reports emanate from well equipped institutions and clinics operated by men possessing a very large experience, and no matter how successful their results, these bear little relationship to those cases that will come to inexperienced operators, working with an insufficient armamentarium.

The man with an X-ray tube or a tube of radium of insufficient activity who is willing to apply it indiscriminately to all growths that may be presented to him for treatment is no better than any other kind of cancer quack and, in the present state of indiscriminating enthusiasm in the lay mind, he is much more pernicious.

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¹ The literature reviewed was that of the past five years but some of the more important earlier communications are included. The present European situation has prevented access to some desirable material.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY

SURGICAL TECHNIQUE

ANÆSTHETICS

Bevan, A. D.: Choice and Technique of Anæsthetic. *J. Am. M. Ass.*, 1915, lxx, 1418.

It is the purpose of the author's paper to analyze the many existing methods of anæsthesia with the object of determining, if possible, in a judicial way, what anæsthetics should be selected and what technique should be employed in a general surgical clinic. In making this analysis and in arriving at conclusions, certain requirements have been kept in mind: (1) the safety and comfort of the patient; (2) the efficiency of the anæsthetic agent; (3) control, avoiding anæsthetics which cannot be withdrawn with the first appearance of danger; (4) the simplicity and general adaptability of the method; (5) after-effects on blood-tissues and viscera; (6) complications, vomiting, etc.; and (7) effects on immunity against pus organisms, pneumococci, etc.

He has analyzed the following: chloroform, ether, nitrous oxide gas, scopolamine and morphine, spinal anæsthesia, blocking, infiltration, intravenous, general and local, intrarectal, intratracheal, intrapharyngeal, mixtures, sequences, and anoci-association.

The complicated sequence of scopolamine and morphine, gas, oxygen, ether, novocaine and quinine and urea hydrochloride is a method open to many objections. The scopolamine and morphine add distinctly to the risks of the patient and should be omitted. The gas-oxygen plus ether, if used alone, is an acceptable anæsthetic sequence, but not so safe a routine anæsthetic as drop ether and gas and oxygen used alone in properly selected cases. Novocaine used alone in infiltration anæsthesia is of great value and has a wide field of usefulness. Used in this sequence it has little value, certainly none in preventing shock. Quinine and urea hydrochloride has no value in this sequence and used alone as an anæsthetic cannot compete with novocaine and epinephrin. He believes, therefore, that we must reject both the theory and the practice of anoci-association.

The final results of his analysis of the anæsthetic problem are summarized as follows:

1. Drop ether should be today chosen as the standard general anæsthetic when a prolonged anæsthetic is desired with relaxation and unconsciousness.

2. Intraparyngeal ether should be chosen in mouth and jaw cases when it is desirable to remove the anæsthetic apparatus from the operative field.

3. Gas should be chosen in short anæsthesias in which unconsciousness is desired, and in special cases, such as kidney insufficiency.

4. Local infiltration anæsthesia should be chosen when the surgeon has the full co-operation of the patient and when the field of operation can be completely infiltrated and anæsthetized by a safe amount of novocaine and epinephrin.

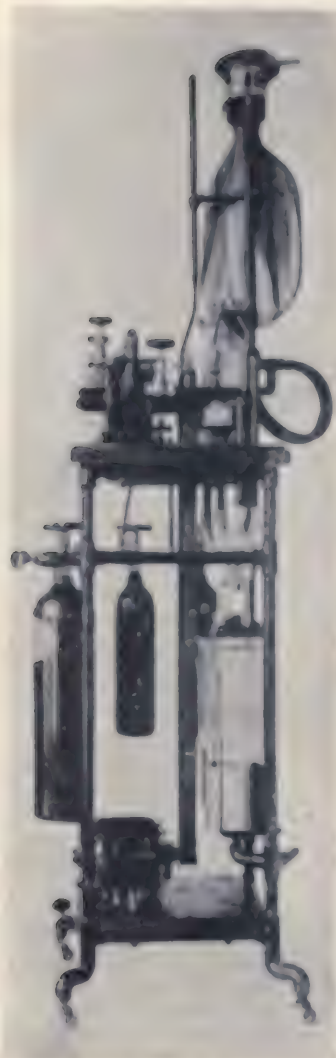
These four simple and safe methods can be made to cover all surgical cases. This places anæsthesia on a very simple, unpretentious basis.

EDWARD L. CORNELL.

Jackson, D. E.: A New Method for the Production of General Analgesia and Anæsthesia. *J. Lab. & Clin. Med.*, 1915, i, 1.

The author presents a new method for producing and maintaining any desired and attainable degree of analgesia or anæsthesia, depending on the pharmacological action of the anæsthetic substance used. The method may be used to administer nitrous oxide, ether, chloroform, ethyl chloride, ethyl bromide, "somnoform," etc. Oxygen (and never any air) is administered with these anæsthetics in proportions suitable to maintain the patient in a satisfactory condition. None of the oxygen or any of the anæsthetic substance is allowed to escape to the surrounding atmosphere. Thus only one initial administration of the anæsthetic is required for a prolonged anæsthesia, for this initial dose (nitrous oxide, ethyl chloride, etc.) is retained within the tissues of the patient and in the apparatus throughout the anæsthesia. Only so much oxygen as the patient actually consumes need be given. Asphyxia is completely controlled by washing the respiratory medium (including the anæsthetic gas or vapor) through a solution of sodium, calcium, potassium, or barium hydrate which absorbs the carbon dioxide exhaled by the patient, while at the same time the necessary amount of oxygen is added to the respiratory medium (and anæsthetic gas or vapor).

The method can best be explained by reference to Figs. 1 and 2. Fig. 1 represents a diagrammatic plan of the apparatus. A small motor (1) by means of a belt operates a small rotary air pump (2). From the pipe (3) air (or other gaseous medium, e.g., nitrous oxide and oxygen) enters the pump.



(Continued from Lab. & Clin. Med.)

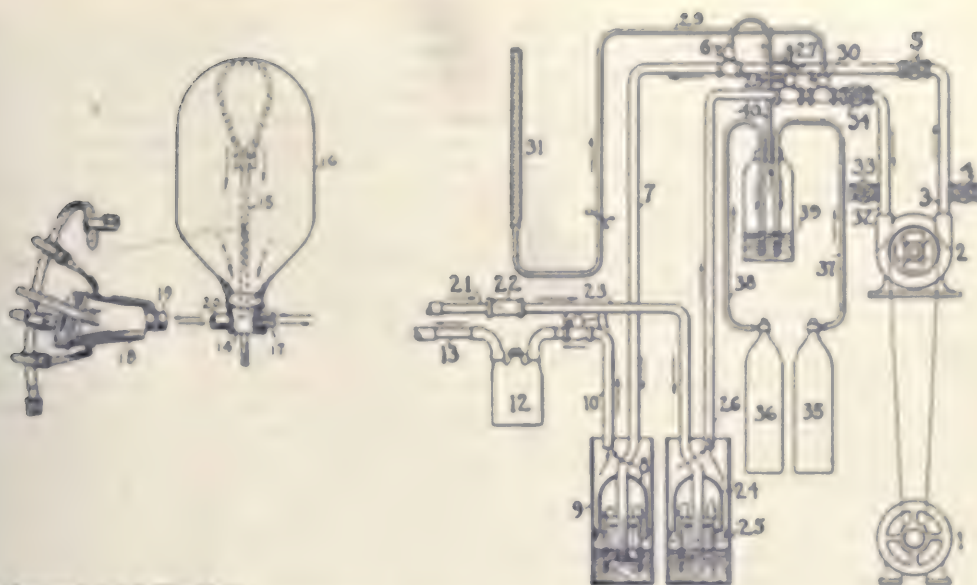
Fig. 1. Schema showing the general plan of the apparatus together with the head-piece, breathing-bag, and muzzle as arranged for use with animals. The arrows indicate the direction of the air current. No. 33 represents the oxygen tank and No. 34 the nitrous-oxide tank. In reality the apparatus carries two tanks each of oxygen and nitrous oxide.

This air is rapidly forced out again at pipe (3), through which it (passing by valve 4) passes through valve (5), thence passing by the air-cock (6) by pipe (7) to the wash-jar (8), containing a strong aqueous solution of sodium and calcium hydrates. (Barium or potassium hydrate may also be used.) This jar contains a special glass washing device (9). From the wash-jar the air passes out through pipe (10) to the Woulff bottle (11) which serves as a safety device, permitting the operator to see that no

fluid, etc., ever passes out toward the patient. Through pipe (13) the air (and anæsthetic) passes to the face-piece and breathing bag which in Fig. 1 is made for dogs. The connection between pipe (13) and the metal tube (13a) is effected by means of a rubber tube having an inside diameter of three-eighths of an inch and a length of three or four feet, depending on the convenience of the operator. Tube (13a) passes into the metal cylinder (14) and then turns upward at a right angle, becoming pipe (15). From the top of this pipe the air (and anæsthetic) is blown out into the breathing-bag (16) which is made of very thin rubber and is supported in an upright position by means of a coiled metal spring fastened to the top of pipe (14). This spring is shaped like a horseshoe and is very flexible. The bag should be one and one-half or two times the vital capacity of the animal or patient treated. The neck of this bag is stretched (air tight) over the upper end of the cylinder (14). From cylinder (14) a tube (17) conducts the air, etc., away from the breathing-bag (and animal or patient). Here another rubber tube exactly like the one connecting pipe (13) with tube (13a) is used to connect tube (17) with pipe (21). Thus the air, etc., circulates rapidly and freely through the breathing-bag. But the air in this bag is not under any increased pressure (above that of the surrounding atmosphere) unless the operator purposely overfills it. For animals (dogs) a metal muzzle (18) is used. This carries a heavy piece of rubber dam which is tied (air tight) over the base of the muzzle. In the center of this rubber dam is a round opening through which the dog's nose and mouth are thrust. The muzzle is held on by leather straps. The flange (19) connects with the breathing-bag (16) by being slipped tightly over the flange (20). Thus the animal breathes freely back and forth into and out of the bag. The face-piece and breathing-bag for man (Fig. 2) are constructed on the same principle except that there is a large hinged doorlike valve at the neck of the bag which may be closed to retain the anæsthetic within the bag when the face-piece is removed (e.g., if the patient vomits).

From pipe (21) the air passes through a check valve (22), which prevents accidental reversal of the air current, thence by pipe (23) to the wash jar (24), which contains sulphuric acid. This removes the excess of watery vapor which has been exhaled by the patient and also sterilizes the air. Both the acid and the sodium hydrate solution serve to constantly re-purify over and over the anæsthetic as it circulates through the apparatus.

From the jar (24) the air passes through pipe (26) back to the pump (passing by air cock [25] and valve [33] and through valve [34]). This completes the circuit of the air (and anæsthetic) which meanwhile has lost some oxygen to the patient, but has acquired some carbon dioxide from the patient. This carbon dioxide will be quickly removed from the air by being absorbed by the sodium hydrate solution (sodium carbonate being formed). The oxygen is



(Courtesy J. Lab. & Clin. Med.)

Fig. 2. General view of the right-hand side of the apparatus. The face-piece and breathing-bag as arranged for man are shown at the top of the apparatus. Just to

replaced from a tank (35) from which a tube (37) leads to the wash bottle (39). From the bottle a tube (40) leads through the air-cock (6) into the air system. A nitrous oxide tank (36) is similarly arranged for administering nitrous oxide.

It is thus seen that the lungs of the patient, the breathing-bag, and the apparatus form a closed air system. From the lungs of the patient oxygen and any anæsthetic substance contained in the respiratory medium may be absorbed by the patient's blood and carried out to his tissues. Thus if the respiratory medium contains 90 per cent N_2O and 10 per cent oxygen, these gases will be absorbed (according to the relative affinity of the patient's blood and tissues for each) in their corresponding proportions. Since there is no escape to the outside atmosphere and N_2O is not decomposed either by the patient's tissues or by the sodium hydrate or sulphuric acid, it is evident that only one initial injection of nitrous oxide is needed to produce and maintain a prolonged analgesia or anæsthesia. The degree of the analgesia or anæsthesia should remain practically constant, since all eliminated CO_2 is quickly absorbed in the apparatus and the oxygen actually needed by the patient is constantly injected into the system from the tank (35). These same principles also hold good for chloroform, ether, ethyl chloride, ethyl bromide, etc.

The anæsthetic is automatically warmed by the sulphuric acid (which becomes warm from its absorption of watery vapor), and also by the pump which warms the air passing through it by compression and by friction. Just before it goes to the

the left of the bag is shown a 25-ccm. burette (graduated to tenths of a ccm.) used for the injection of ether, chloroform, etc., into the air system.

patient the respiratory medium receives moisture from the sodium hydrate solution, so that by varying the amount and quality of acid used, the relative humidity of the air may be regulated.

Most of the experiments have so far been performed on dogs. The article contains a tracing of the blood-pressure and respiration of a dog under nitrous oxide anæsthesia, which was continued for more than five and one-half hours. Both the blood-pressure and respiration remained practically constant throughout this period. A rather unsatisfactory theoretical calculation has shown that for a dog weighing 15 pounds (one-tenth the weight of an adult man) nitrous oxide anæsthesia by this method should cost approximately \$0.0300 per hour. The author believes that he has probably used more oxygen and sodium hydrate than this figure would represent, but he has wasted a good deal of these substances in various experimental procedures. The nitrous oxide used is probably within the limits of its relative proportion of the cost indicated. The cost should be less for anæsthesia with ether, chloroform, etc. The greatest expense for anæsthesia by this method will probably be the cost of the oxygen, and this is regulated by the amount actually consumed, as none is allowed to escape.

In Fig. 1 a burette (31) is connected by a rubber tube (39) to the air-cock (30). From this burette ether, chloroform, etc., may be administered in exact dosage. Another air-cock (28) carries a short piece of rubber tubing (27) through which very volatile substances, as ethyl chloride, ethyl bromide, etc., may be injected into the air system.

If the pump be stopped for a time carbon dioxide will accumulate in the breathing bag. Thus any desired amount of rebreathing of carbon dioxide may be accomplished. During this period the amount of the anesthetic within the tissues (and central nervous system) of the patient may remain perfectly constant, and at the same time oxygen may or may not be administered, as the operator desires. Thus at all times the anesthetist has command of (1) the exact amount of anesthetic administered, (2) the amount of oxygen given, (3) the extent (if any) of carbon dioxide rebreathing which he desires the patient to have. Each of these factors may be controlled separately and independently of the others. Any desired sequence or combination of the above anesthetics may be obtained. A few drops of oil of bitter orange peel may be injected into the air system to perfume the air and conceal the odor of the anesthetic if desired. By special adjustment the apparatus may be used for intratracheal insufflation.

It is one of the basic principles of pharmacology that most anesthetic substances which are administered through the lungs by inhalation, are almost totally excreted again by exhalation from the lungs. By means of the constant circulation of the air within the machine, the exhaled anesthetic is simply carried around, washed through the sulphuric acid and sodium hydrate solution, and again returned to the animal for rebreathing.

Beates, H., Jr.: A Report of Practical Experience with Narco-Anesthesia. *Am. J. Surg.*, 1915, 144, 145.

The author records his experience with narco-anesthesia. The first claim of advantage is the avoidance of apprehension and distress accompanying ether anesthesia; another is the diminished respiratory disturbance from hypersecretion of mucus which, if accompanied by struggles of the patient, makes, especially in unskilled hands, induction with ether anything but smooth. For narco-anesthesia is also claimed elimination of gastric disturbance and advantages of long rest following the operation, the patient awaking from unconsciousness without nausea and without prostrating relaxation. A further advantage claimed is the avoidance of the disintegrating effect and functional disturbance of the erythrocytes which contributes so largely to surgical shock. The inference is that shock is largely the result of apprehension and fear, and unconsciousness from ether alone will leave the cerebrum vulnerable to shock from trauma, as Crile teaches; therefore, narcotics are indicated, with or without ether. Post-operative ileus is totally absent.

The technique of the method is as follows: An hour and a half before operation a hypodermic injection of 1/10 of a grain of scopolamine hydrochloride and 1/6 of a grain of morphine is given. A half hour later this is repeated and again twenty minutes after the second; the third, perhaps, without

the morphine. At the time of the third injection an enema is given of two fluid ounces, each, of spiritus etheris compositus and spiritus frumenti with four ounces of water. As a rule, sufficient narco-anesthesia has been induced by this time to render practicable the performance of any operation. Occasionally, the patient only slowly becomes somnolent, opening his eyes when transferred to the operating table. More rarely he is awake enough to raise his head and look about, consciousness, however, being absent, or, at least, no recollection thereof remaining afterwards. In such a case, another injection, now of apomorphine hydrochloride is given, which accomplishes the desired narco-anesthesia within three to five minutes. In only one instance did any vomiting follow the use of apomorphine. It is claimed that the synergistic effect of the latter, combined with the preceding injections, fails to produce the full physiological effects of equal doses of morphine alone, for example, the pupil is not contracted and the respiration not modified; the flushing of the face is less than with the scopolamine alone. Practically one in twenty-five cases demands a fourth and, still more exceptionally a fifth, injection of the scopolamine-morphine combination; but, even in these cases, the claim is made, the respiration was but little modified and the toxic manifestations of equal doses of either morphine or scopolamine alone were absent.

In cardiorenal and arteriosclerotic cases it is urged in preference to ether, a surprising result being no lessening of renal function, unless five injections were given and then "but slightly for a few hours." An attendant should be at the patient's head watching for any respiratory obstruction from the tongue falling back. The opinion is expressed that some of the reported fatal cases of scopolamine anesthesia, "not narco-anesthesia," were instances of asphyxia. The use of tongue-forceps, by the way, is properly condemned.

In cases of operation for mammary carcinoma, for example, consciousness was regained in from three to seven hours without disastrous after-effects and with ability to take nourishment earlier and more liberally than after ether.

The fear of post-operative ileus in abdominal operations was not realized in any case. The absence of nausea and vomiting commends narco-anesthesia for hernia, and for extensive plastic operations, as for complete proctostomia. The absence of changes in the blood is another argument put forth, and ophthalmic operations, as iridectomy and for cataract, have been successful. Other cases were suprapubic prostatectomy, thigh amputation, and nephrectomy. The delirium which has been said to accompany scopolamine anesthesia was not manifested in a single case of this combination.

"Twilight sleep" must not be confounded with narco-anesthesia. The author is bold enough to not only recommend it for children but urges that large doses for tonsillectomy are necessary to produce

absolute abolition of the pharyngeal reflexes, the prolonged narcotism, however, necessitating the inconvenience of an intelligent attendant remaining with the little patient until he is fully conscious.

In neck operations, such as thyroidectomy and tuberculous glands, it aids the freedom of the procedure. The complaint from ether being the turbulence of veins caused by struggles of the patient.

Three months' experience led Beates to apply it also for such post-operative treatments as removal of drains, wound packing, etc. FRANK W. PINNEO.

Cole, H. P.: Some Observations on Local Anesthesia. *Tr. South. Surg. & Gynec. Ass., Cincinnati*, 1915, Dec.

Cole presents a résumé of 115 major operations which he performed in his clinic within the past two years. This group includes 87 abdominal operations upon the appendix, gall-bladder, stomach, intestines, ovary, and uterus. He reports one case of nephrectomy, three cases of radical amputation of the breast for carcinoma, two cases of decompression of the skull, one of exenteration of the orbit for sarcoma.

Seven abdominal operations were performed during pregnancy without maternal mortality.

Seven major operations were performed upon children under two years of age, with one death from bronchopneumonia twelve days after the establishment of a Littré artificial anus in a child 3 days of age.

Forty-seven cases were operated upon between the ages of 50 and 87, with a mortality rate of 4.5 per cent — 2 deaths. The death in one case occurred on the eighth day following enterostomy on the fifth day of ileus and peritonitis in a patient 65 years of age. The second death occurred on the fourth day following drainage on the sixth day of peritonitis in a patient 68 years of age.

Cole concludes that the selection of local an-

esthesia as the anæsthetic of choice in cases offering grave mortality risks is a factor of safety too potent to be neglected.

SURGICAL INSTRUMENTS AND APPARATUS

Bowers, L. G., and Ross, L. F.: A Simple and Satisfactory Closed Ether Apparatus. *Surg., Gynec. & Obst.*, 1915, xxi, 521.

The apparatus consists of a U-shaped pipe (plumber's trap) one and one-fourth inches in diameter with arms two and five inches long respectively. The rubber bell of a "plumber's friend" is fitted over the short arm to form the mask after being cut to fit over the nose. Several masks with various shaped nose openings are necessary. A No. 3 soft rubber English ice-bag is fastened over the long arm with a rubber band. A small hole to admit air is punched in the mask or drilled in the pipe at a point where it may be conveniently covered by the anæsthetist's finger.

Six ounces of ether are poured into the bag and the mask gradually lowered over the face with the air vent open. The vent is then gradually closed and kept closed except when necessary to admit air to prevent cyanosis.

The advantages are:

1. The lessened frequency of nausea and shock due to the small amount of ether used, four ounces being sufficient for an average abdominal operation.
2. The lessened bronchial irritation due to the use of warm ether vapor.
3. The rapid induction of anæsthesia and its easy control.
4. The stimulation of the respiratory center by the rebreathed carbon dioxide.
5. The absence of ether vapor from the operating room.
6. The simplicity, cheapness, and portability of the apparatus.

SURGERY OF THE HEAD AND NECK

HEAD

Tabuteau, G. G.: The Treatment of Gunshot Wounds of the Head, Based on a Series of Ninety-Five Cases. *Brit. M. J.*, 1915, ii, 501.

The author comments upon the very frequent discrepancy which is noted between the lesion in the scalp and skull. A small, insignificant wound of the soft tissues may be accompanied with extensive fracture of the underlying bone, and vice versa, a large scalp wound may be free from fracture of the skull cap.

Severe damage to the skull may be unaccompanied by definite symptoms, and this in itself should serve as a warning to examine all scalp wounds very carefully for bone lesion. Undiscovered fractures, depressions, etc., often lead to complications.

One case in particular is pointed out to show the necessity of proper surveillance over what may appear to be a mere scalp wound. The man entered the hospital with a small healed scab over the left temporal bone. He was kept in bed for ten days during which he exhibited no symptoms. On the twelfth day he had two fits. At operation the next day the dura was found non-pulsating and discolored. When incised crucially about 1 dram of disintegrated pulped brain welled out and was carefully wiped away. The wound was stitched, and a drain left in place 48 hours. Primary union occurred without further trouble. Recovery was complete.

The rule of the hospital is to put all cases of head injuries to bed, shave the entire scalp, and administer a purgative. A careful history of the case is ob-

tained. Was the blow sufficient to stun the patient? Do the entrance and exit wounds lie separated by a bridge of scalp overlying a convexity of bone? (A condition which points almost invariably to fracture.) Thorough exploration after excision of the skin wound and pericranium should be made to facilitate examination of the skull cap. Trephining of the skull should be done in all cases of doubt, and this is especially recommended if the bone is bruised or the pericranium lacerated. Trephining is always in order, even when external signs are absent, if loss of function of even a temporary nature, persistent headache, giddiness, vomiting or other signs of cerebral irritation are present. When the dura is discolored, non-pulsating, and doughy it should be opened by a crucial incision. The brain matter underneath is generally disintegrated. Unless it is let out it will act as a foreign body, cause elevated temperature, and end in abscess. Enough bone should be removed until an area of healthy dura one-half inch broad has been exposed. Transport of all serious head cases should be delayed. Removal of all easily accessible foreign bodies should be attempted through the torn dura, by careful digital exploration.

Every case which points to fracture of the skull is given antistreptol, grains 10 to 20 every four hours, and a purgative is administered. The scalp is shaved, washed with soap and water, then with ether, and painted with tincture of iodine. Another coat of tincture of iodine is applied when the patient is on the operating table. The seat of operation is infiltrated by a circular area, with a one per cent solution of novocaine to which adrenalin chloride has been added. A hypodermic injection of morphine, one-fourth grain, and one one-hundredth grain atropine is given an hour previously. By this means shock is reduced and the amount of anæsthetic necessary is much reduced. The use of adrenalin renders the operation practically bloodless.

LOUIS A. LAGARDE.

Roberts, J. E. H.: The Treatment of Gunshot Wounds of the Head, with Special Reference to Apparently Minor Injuries. *Brit. M. J.*, 1915, ii, 498.

According to Captain Roberts there is a large number of gunshot wounds of the scalp to be found in the base hospitals. We might add that this is true of modern wars, because the head is exposed to fire more than the remainder of the body as a result of fighting under cover. We may also add that this is especially true of the trench fighting which is now taking place on the western front. Head cases generally form a larger ratio than they did in the days when much of the fighting was done in the open. At the front the surgeon sees all the head cases. The severe cases nearly all succumb in the first 24 hours, and the proportion of cases transferred to the base hospitals is made up of lighter cases, a fairly large number of which come under the class of apparently minor injuries referred to.

According to Longmore the head and face offer a target area of 2.89 per cent compared to the target area of the rest of the body. If men fought standing in the open the percentage of head wounds to the total number of casualties would correspond very nearly to the above ratio, but rapidity and accuracy of fire with modern engines of war have compelled tacticians to drill their soldiers to fight lying down and behind shelter as much as possible. The Crimean War gives us 20 per cent of wounds of the head, face, and neck because nearly all of the fighting was done behind entrenchments. In the Spanish-American War out of 4,536 gunshot injuries of all parts of the body the head, face, and neck were injured in 15.26 per cent of the total. Liege operations were seldom resorted to in this war, the men fought lying down as much as possible. No doubt the World War will give a higher percentage of head wounds than has hitherto been seen in warfare.

Captain Roberts gives the lesions found in 120 scalp wounds: Many of the cases exhibited few or no symptoms, they were admitted as "sitting" cases, a fact which caused the surgeons to overlook the presence of definite injury to the skull or brain in at least 40 per cent of the whole. Out of the 120 cases there were only 82 scalp wounds.

Fracture of outer table only.....	10
Fracture of inner table only.....	1
Fracture of both tables, dura uninjured.....	18
Fracture of both tables, dura lacerated.....	1
Fracture with laceration of dura and brain.....	10

Roberts advises careful examination in all scalp wounds by gunshot. The surgeon should carefully weigh the mechanism of the projectile which caused the injury. An injury to the skull or brain is usually less severe as a result of the slower velocity missile from a shrapnel or shell fragment. In such cases a depressed fracture is most generally found. In a rapidly moving rifle projectile which strikes the skull at a tangent the injury is very much the same, but the greater momentum imparted to the inner table and brain causes more minute fragmentation of the former and deeper lacerations in the latter.

Any disturbance of cerebral function or lesion of cranial nerves should be noted. Eye grounds should be examined. The anamnesis is important. Unconsciousness especially deep and prolonged lends suspicion to fracture or brain injury. Persistent headache is suspicious. Transient local paralysis, local spasm, or epilepsy are not necessarily associated with gross trauma of the brain, but one should at least look for depressed fracture or localized hæmorrhage.

There may be propulsion of fragments of bone in the brain substance; the dura may be lacerated or displaced by bone; the yielding outer table may push the brittle inner table enough to fracture it, with no apparent lesion to the outer table. When the momentum thus imparted is sufficient the broken inner fragments may be detached and driven into the brain substance, so that at operation one

should see that of all the fragments removed none are missing. Although the dura may not be lacerated, pulsing of the brain may be marked. Unless allowed to escape through a small opening in the dura the disintegrated brain substance will act as a foreign body and cause further destructive changes in the brain substance, and finally, cerebral symptoms may be due to concussion or other brain injury which cannot be relieved by injury.

The author points to three cases which illustrate the possible presence of severe lesion in the absence of severe symptoms, such as all surgeons of experience have seen.

In the examination a skiagram is valuable in indicating the presence and location of metallic foreign bodies. It should be taken at right angles to the wound. The findings are not always reliable in indicating fracture. Fracture of the inner table with depression may be present without showing on the plate, and again the plate may apparently show a depressed fracture of the inner table when no such lesion is present. The wound should not be probed lest superficial infection be carried deeper. In septic wounds and oedematous scalp, unless the indications are urgent, apply hypertonic saline treatment for one or two days before operating. Give urotropine, 20 grains, three times per day in all head cases; shave the scalp completely and paint with iodine.

The operative technique consists in the removal of all infected tissues by steady the scalp with the fingers and making two incisions surrounding the wound which shall go down to and include the pericranium. The tissue thus isolated is entirely stripped off the bone and removed. The instruments are then rejected. The incision just made is the first step and should not be deferred to a later stage in the operation. The wound should under no condition be enlarged through its septic edges, and never until the completion of the preliminary excision, otherwise the chance for primary union is improbable. The bone is next carefully examined, the periosteum being further stripped up if necessary. In the absence of bone injury the wound is sutured without drainage. If fracture is present, enlarge the wound if more room is necessary, a half inch trephine crown is raised, all loose fragments and any possibly infected bone are removed, using the craniectomy forceps if necessary. If the dura is uninjured the wound is closed without drainage, and mastic wound varnish and gauze applied. A firm compress of gauze is put in place for 24 hours. When the brain is lacerated, explore gently with the index-finger, remove any fragments of bone or metal when readily accessible, place a drain into the brain and suture the wound as before.

Of the 118 cases closed by primary suture without drainage 114 healed by first intention, 3 showed slight superficial sepsis, and 1 broke down altogether.

The size of the wound at times offers difficulty in making proper approximation. This is overcome most generally by freeing the scalp for some dis-

tance around the wound by lifting the cranial aponeurosis with an elevator.

It is inadvisable to open the dura in the presence of a septic wound. In 30 cases in the Rouen area in which excision of the infected wound was first resorted to, the dura was opened without a death. In 3 cases in which the dura was opened without excising the area of infected tissue, cerebral abscess and death occurred.

The methods insisted upon are as follows:

1. Careful preliminary examination.
2. Early operation on every scalp wound however slight.
3. Complete excision of all infected tissues at the commencement of the operation.
4. Removal of all accessible foreign bodies from the brain.
5. Primary suture of wounds.

LOUIS A. LAGARDE.

Horsley, J. S.: *Plastic Operations for Acquired Deformities of the Face. Tr. South. Surg. & Gynec. Ass., Cincinnati, 1915, Dec.*

Horsley calls attention to the fact that plastic operations on the face are usually not life-saving procedures, but they relieve not only the discomfort and mental anguish of the patient, but also the patient's associates who must daily view the deformity. Plastic surgery of the face requires ingenuity to meet unusual conditions and to make things fit. The age and health of the patient must be given due consideration. While general principles can guide in certain groups of cases, each case is a law unto itself. Therefore, a paper on such a subject must deal largely with reports and illustrations of individual cases.

Dividing the face regionally, he reports three cases of deformity of the forehead following the loss of a portion of the anterior wall of the frontal sinus. The infundibulum is probed, and if not sufficiently large, gauze is run through it. Then small skin-flaps are taken from the margins of the defect and turned in, cutting the pericranium farther out than the skin so it can be overlapped like a double-breasted coat. The raw surface is covered by sliding flaps from other portions of the forehead.

A deformity of the eye caused by fracture and displacement of the portion of the bone to which the inner canthus was attached was corrected by replacing the bone and shortening the upper lid.

Deformities of the nose are corrected by grafting bone from the rib or by sliding a flap including mucous membrane and cartilage from the septum of the nose.

Large openings in the cheek are closed by transplanting a flap from the forehead with the attached anterior temporal artery dissected out and transplanted into the new position.

Defects in the lip are corrected by various methods. When the whole thickness of the lip is involved, as after noma, flaps which include mucous membrane are slid up from the cheek. In other instances,

flaps are transplanted from the neck or from the arm. When the arm is used the pedicle is cut in about two weeks.

Stewart, and Lockett, W. H.: The Roentgen Diagnosis of Fracture of the Skull. *Arch. Radiol. & Electrotherap.*, 1915, 18, 130.

The authors consider that the majority of fractures of the skull are not diagnosed as such and remain undiscovered. They emphasize the aid that can be rendered by the roentgen ray in discovering and locating such fractures. The X-ray has frequently demonstrated this lesion where there were no symptoms, and it is important to diagnose a fracture on account of remote sequelae, etc. Every patient who receives a blow on the skull or point of the lower jaw, either directly or from a fall, should be considered as suffering from a fractured skull unless proven otherwise. Every X-ray examination should cover the frontal, parieto-temporal, occipital, and basilar regions, whether there are objective symptoms pointing to these regions or not.

The authors give the technique for the procedure of examination of these regions, and give illustrative plates. Generally high vacuum tubes are employed, with an exposure of from three to five seconds.

HOLLIS E. POTTER.

Weisenburg, T. H., and Work, P.: Diagnosis of Tumors in the Posterior Cranial Fossa. *J. Am. M. Ass.*, 1915, LV, 1345.

In a comprehensive manner the authors give their views on cerebellar localization and symptomatology—a field which heretofore they feel has been rather slighted. The tentative localization of Mills and Weisenburg has been used in their studies.

The chief function of the cerebellum is to synergize all body movements. Whatever symptoms are present, are due to a loss of synergy which may be in any part or parts of the body.

The lesions are strictly confined to the cerebellum. Most tumors are glomatous and of slow growth, tending to invade the middle rather than the outer portions of the cerebellum. The synergic center for the upper trunk and shoulder girdle is in the superior vermis, and that for the lower trunk in the inferior vermis, consequently in such lesions there are always alterations in station and gait. There is always a marked difference in these alterations in the shoulder girdle and pelvic girdle cases. In the first the alteration is above the hips, whereas in the latter it is entirely below the hips. The best way to differentiate is to place the patient on his hands and knees on the floor.

Whether the phenomena of nystagmus in cerebellar lesions should or should not be present is unsettled. However, if it be developed by voluntary movement, the lesion is probably extracerebellar, and this form of nystagmus is probably the result of implication of those fibers which are in

relation to the vestibular apparatus outside the cerebellum.

As to general symptoms, cranial nerve symptoms indicate an extracerebellar lesion. Diastoma with ear symptoms indicates that the lesion is also extracerebellar, probably somewhere in the vestibular apparatus. Motor involvement, as a rule, indicates a pontine lesion. Headache, nausea, vomiting, and choked disk indicate a lesion in the crux or pons, pressing on the sylvian aqueduct.

Little definite knowledge is to be found concerning the functions of the cerebellar peduncles. The inferior ones probably are concerned with the synergic movements of the lower limbs, the middle ones with the trunk and head, and the superior ones with cerebral and cerebellar association. Lesions confined to any of these cause asynergic symptoms in all parts of the body.

Tumors of the superior peduncles grow from the third ventricle through the sylvian aqueduct and press on one or both red nuclei. The symptoms consist of a gradually developing paralysis of associated ocular movement upward; central disturbance of hearing, bilateral or unilateral, when the lesion extends laterally; partial weakness of both upper and lower limbs; increased reflexes and the Babinski reflex.

Lesions of the middle cerebellar peduncles are rare. They usually extend from the pons to the cerebellum via these peduncles or vice versa. In these lesions the associated phenomena consist of the fifth and sixth nerve symptoms on the side of the lesion, with sensory and motor phenomena on the opposite side.

Lesions of the inferior cerebellar peduncles are very rare. They are usually associated with a cerebellar tumor. The ninth, tenth, and twelfth cranial nerves show signs of disease.

Lesions of the cerebellopontine angle are usually fibromatous growths and occasionally a cyst forms. These grow, as a rule, from the eighth cranial nerve and give rise to corresponding symptoms. Later, the seventh, sixth, and fifth nerves become involved.

In large tumors, owing to pressure on the cerebellum, cerebellar asynergy of the limbs on the same side occurs. In the usual tumor, the cerebellar symptoms are not marked and the asynergy is limited to the arm or leg of the same side.

P. M. CHASE.

Grey, E. C.: Studies on the Localization of Cerebellar Tumors; Posterior New-Growths Without Nystagmus. *J. Am. M. Ass.*, 1915, LV, 1341.

An attempt is made to determine the proportion of patients with certified subtentorial neoplasms who have shown no nystagmus before operation. The records of 51 cases are from Cushing's services at the Johns Hopkins and Peter Bent Brigham Hospitals.

In the series, 34 were verified cases of cerebellar tumor, and 17 were extracerebellar. Eleven showed

no nystagmus previous to operation and all of these revealed intracerebellar growths — 32 per cent.

There were marked differences in the degree of intracranial tension in both groups; i.e., those with and those without nystagmus. In each group there were new-growths involving the vermis, and others replacing a part or the whole of the hemispheres.

In 5 cases without nystagmus, caloric examinations resulted in characteristic rhythmic eye movements from either labyrinth in 5 cases.

In 40 verified cases of tumors lying anterior to the cerebellum, 8 showed nystagmus before operation. In 7 cases without nystagmus, caloric examination provoked characteristic eye oscillations from either labyrinth in 6.

In conclusion, Grey states that when a patient exhibits a cerebellar tumor syndrome without nystagmus, the absence of this phenomenon points toward an intracerebellar localization of the lesion, and that, in many cases, this absence cannot be accounted for by an impairment of the fundamental mechanism of nystagmus.

P. M. CHASE.

Porter, L.: An Apparently Complete Recovery After Operation for Cerebellar Tumor. *Arch. Pediatrics*, 1915, xxxii, 727.

The patient, a girl of eleven years, was well nourished, but had been sick three years. At the time of operation she showed the usual signs of a tumor of the right hemisphere of the cerebellum. The operation was a two-step one. The first step was the exposure of the cerebellum by a typical Cushing cross-bow incision above the superior curved line. The skin was dissected back sufficiently to cut the muscles at the lower level. The muscles were separated from the skull and down to the second cervical vertebra in the midline. Trephined openings over the left and right cerebellar lobes revealed bone of paper thinness on the left with no diploë, on the right the bone was about of normal thickness. The bone was removed so as to uncover the entire cerebellum from well above the lateral sinuses down to and including the posterior half of the foramen magnum and from mastoid to mastoid. A small tip of bone was left projecting over the torcular hæmophilii. The muscles were re-sutured, the skin sutured, but no drainage instituted. The patient bore the operation extremely well. No new (cerebellar) symptoms developed.

One week later the second operation was performed through the original opening. On opening the muscular suture, there was an escape of cerebrospinal fluid from an accidental opening of dura—between the areas of the first and second cervical vertebrae. Fluid escaped in a jet about 4 or 5 cm. in height. After controlling oozing, the dura over the left cerebellar hemisphere was opened by transverse incision from mastoid to occipital sinus, then completely excised over this hemisphere within 0.5 cm. of the bone edge. The brain bulged well into the wound. The right side was similarly treated. The

tentorium, cerebellopontine angles, the base of the cerebellum and the region of the vermis were thoroughly explored by retraction. No evidence of tumor was found. A trocar introduced into the right cerebellar lobe encountered a marked resistance at a depth of about 1 cm. The left cerebellar lobe was explored and no such resistance encountered. An incision was made about 3 cm. long transversely to the outer side of the presenting aspect of the right cerebellar lobe; at a depth of about 1 cm. the knife met resistance. Retraction of the wound edges with spatulæ showed the cerebellar substance to be yellowish in color; otherwise no abnormality was seen. A finger gently introduced in order to determine the nature of the resistance perforated a cyst which was 4 to 5 cm. in diameter. It involved the right cerebellar lobe inward toward the vermis, occupying roughly the area normally taken by the nucleus dentatus. The cyst wall was perfectly smooth. The muscles were sutured with a few heavy silk and numerous fine sutures. Horse-hair was used for the skin. No drainage was employed. A plaster cast was applied. Following operation there was a mild degree of shock. The patient made an uneventful recovery and left the hospital in eleven days.

An examination made a year and a half later showed the patient to be normal in every way.

EDWARD L. CORNELL.

NECK

Richardson, M. L.: Branchiogenic Carcinoma. *Cleveland M. J.*, 1915, xlv, 581.

The author presents a brief résumé of the literature with the clinical and pathologic findings of a case.

Branchiogenic carcinomata arise from the cysts and fistulæ which represent the remnants of the branchial ducts or glands. The exact mode of origin is obscure. They arise from the embryonic ectoderm and may be composed of squamous cells or of cuboidal or columnar cells. The type of cell will depend upon whether the original cyst was of ectodermal or endodermal origin.

The cysts have been thought to arise from a persistent sinus cervicalis, the ductus thymopharyngeus, or the post-branchial gland. The latter gland when it persists becomes incorporated in the lateral lobes of the thyroid. Tumors arising from this structure have been called "struma post-branchialis."

Of the cases reported in the literature about 90 per cent were in males. Clinically there are two types:

1. In the first type a small superficial tumor just beneath the lower jaw anterior to the sternomastoid which has been present for some time, in some cases since birth, suddenly takes on a rapid growth and invades the deep structures of the neck.

2. The second type begins as a deep-seated affection. Asymmetry of the neck, difficulty in swal-

lowing, and voice changes first call attention to the trouble. Palpation reveals an early fixation to the trachea, esophagus, carotid sheath, and the adjacent muscles. There is associated pain. The diagnosis is difficult and must be made by exclusion.

The tumor may be cystic or solid. The blood supply is scanty, and the interior of the tumor is frequently necrotic and semisolid. Microscopically there is a distinct connective-tissue stroma. The cells are arranged in strands and have a rough pleomorphic arrangement with no stroma between. They are irregular, polyhedral, loosely arranged, and show evidence of a rapid growth.

The case reported is that of a man 47 years of age, whose first symptom was hoarseness of voice. He had noticed a gradual enlargement of the neck for a period of four months. The voice suddenly dis-

appeared completely, and swallowing became difficult.

Physical examination showed the right lobe of the thyroid to be enlarged, irregular, and hard. The larynx was displaced 1 cm. to the left. There was a paresis of the right cord, but no erosion nor tumor. Death occurred from pneumonia.

Autopsy showed a tumor between the trachea and the right lobe of the thyroid, adherent to the trachea, thyroid, and the adjacent muscles. The tumor appeared as described above. There was no evidence of a primary growth elsewhere. There were metastatic cords in the lung. The possibility of the carcinoma having originated in the thyroid or in the parathyroids was definitely excluded by a minute examination of the specimens.

J. R. BUCHHINDER.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Beck, E. G.: *How to Accurately Localize Foreign Bodies in the Chest, and the Method of Their Removal.* *Tr. West. Surg. Ass., Des Moines, 1915.* Doc.

Beck reports 7 cases in which he has removed foreign bodies from the chest cavity, first localizing them by means of stereoscopic roentgenograms, with the assistance of "wire localizers." These little localizers are placed on the skin within the suspected vicinity of the foreign body, and the stereoscope will almost invariably localize to a certainty the foreign body and help to estimate its depth within the chest cavity.

The seven cases occurring in the author's practice are reported as follows:

1. Rubber catheter with bismuth injection locating lung abscess.
2. Bullet in chest.
3. Glass-headed pin within the lung (four years).
4. Two buckshots within the chest (ten years).
5. Pin-tack within the lung, with lung abscess (five years).
6. Lung abscess with two rubber tubes healed in cavity and discovered two years later.
7. Wooden probe two years within an empyema.

In these cases the foreign bodies were localized and removed through external operation.

Beck demonstrated the case of lung abscess in which a pin-tack had been removed, showing a new procedure in operating on lung abscess by implanting a flap of skin five inches long into the lung abscess cavity, thus keeping it open to permit the cauterization with actual cautery of the bronchial openings which lead into the compartments of this abscess cavity. In this case seven bronchial

openings could be plainly seen to open into the cavity. This procedure can be done by indirect illumination with a head mirror, or through a rectoscope with direct light.

This method of localizing foreign bodies was introduced by Beck in the North Chicago Hospital in 1908, and since then in a large series of cases of all types he and his brothers have not failed to localize and extract foreign bodies in all parts of the body. He recommends this stereoscopic method of localizing foreign bodies in preference to the single radiogram, since the latter (for reasons which he explains) is often misleading.

Halsted, W. S.: *Elusive Mobility of the Breast in Case of Retro-mammary Cyst.* *Bull. Johns Hopkins Hosp., 1915, XXVI, 319.*

The case is reported of a healthy woman, aged 43, who four weeks previous to examination had noticed an abnormal hardness in the upper half of the right breast, but causing no pain.

On examination the right breast was found to be slightly enlarged. A well defined area of induration, hard and inelastic, was palpated, with its lower margin level with the nipple. No nipple retraction or shortening of the subcutaneous trabeculae was present. Upon testing the tumor's elasticity, the breast would suddenly slip outwardly under the fingers. To account for this, a diagnosis of retro-mammary cyst was made, which was confirmed at operation.

At operation a hemispherical cyst, the size of an English walnut, was found 1 to 2 cm. within the gland, and its posterior wall protruded hernia-like from the under surface of the breast.

Halsted believes that closer observation would probably demonstrate this peculiar phenomenon, in varying degrees, in all retro-mammary cysts and possibly in solid tumors as well.

PHILLIPS M. CHASE.

Burckhardt, H., and Landois, F.: *Tangential Shots of the Thorax and the Changes Produced by Them in Internal Organs* (Die Tangential-schüsse des knöchernen Thorax und die durch sie erzeugten Veränderungen innerer Organe). *München. med. Wchnschr.*, 1915, lxi, 1957.

The report is based on a large number of cases of tangential gunshot injuries of the thorax that came for treatment soon after the injury, and were kept under observation for a long time. The number of ribs involved varied; more than four were seldom affected. Sometimes the bullets passed through them; the wound canal sometimes extended into the thorax and grazed the lungs; the pleura in some cases was uninjured or only pierced by a fragment of a rib. The danger of infection is greater than in bullet wounds passing diametrically through the chest, on account of the oblique insertion of the muscles and other soft parts, the splintering of the ribs, and the frequent production of an open pneumothorax.

Cases of empyema complicated with pneumothorax offer a rather unfavorable prognosis, because of the tendency to form accessory cavities as a result of the adhesion of the lungs to the walls of the thorax in places. Moreover, the respiratory function is often interfered with by the multiple injuries of the ribs, or the organs of the thoracic and abdominal cavities, the lungs, liver, kidneys, etc., may be injured indirectly by the force exerted on the wall of the thorax. Because of the force and rapidity with which the projectile grazes the thoracic wall, it exercises enormous pressure on the organs lying beneath it. This may cause small hæmorrhages and necroses in the parenchyma of the organ, or multiple small ruptures, such as have been seen at autopsy by the author. The treatment was at first expectant—morphine, digitalis, etc. Where a large surface of the pleura was laid bare, the costal pleura was closed by suture, and the lung sutured into the wound to avoid retraction. Where empyema followed tangential injuries, the ribs were resected at the typical place at the eighth or ninth rib. A. Goss.

Kaminer, S., and Zondek, H.: *Hæmothorax and Adhesions of the Diaphragm in Penetrating Injuries of the Thorax* (Über Hæmothorax und Zwerchfellverwachsungen bei penetrierenden Brustverletzungen). *Deutsche med. Wchnschr.*, 1915, xli, 968.

The great majority of injuries of the thorax, such as generally caused death in 1870-71, now recover uneventfully and without infection. Kaminer and Zondek report 130 cases of gunshot wounds of the thorax. All except 2 cases were characterized clinically by more or less hæmothorax and absolute lack of fever so long as the effusion of blood remained sterile. Even in the cases of pneumohæmothorax there was no fever.

In most of the injuries of the lung the bullet passed entirely through; the bullet canals ran in different directions. There were 22 cases in which

the bullet remained lodged in the body without causing any great degree of inconvenience. In none of these cases where the bullets remained as foreign bodies could any morphological changes be demonstrated in the blood. In many of the cases there was fracture of one or more ribs. In all the cases of rib fracture there was hæmothorax.

Most of the fractures recovered uneventfully with good callus formation. In comminuted fractures the authors warn against applying adhesive plaster strips because of the danger of forcing fragments of bone into the pleura. In a number of cases there were more or less severe subjective changes, though there were no pathological findings in the lungs. Roentgen examination showed that the excursion of the diaphragm was much less than normal, and sometimes there was complete immobility of the diaphragm, even weeks or months after the injury.

In gunshot injuries of the lung where there are subjective difficulties in breathing and percussion and auscultation are negative, a roentgen examination should be made for adhesions and immobility of the diaphragm. A. Goss.

TRACHEA AND LUNGS

Moorhead, R. L.: *Diagnosis and Removal of Foreign Bodies in the Trachea, Bronchi, and Oesophagus*. *Long Island M. J.*, 1915, ix, 409.

The author calls attention to the importance of the history of these cases, especially in children, advising physicians to be on their guard when there is the least suspicion that the trouble can be even remotely traced to such causes. Other views of the author are as follows:

1. The X-ray is the greatest aid in diagnosis and in all suspected cases a roentgenogram should be made.

2. Lower tracheobronchoscopy has rapidly become obsolete, and it can be said that a tracheotomy is now seldom, if ever, indicated as an aid to the removal of a foreign body.

3. In children under the age of ten years, no anaesthesia of any kind should be used.

4. Serious organic disease is the only contra-indication in exploratory operations, and there can be no contra-indications once the presence of a foreign body has been positively determined.

5. The chief danger is in continuing any one sitting for too long a period. If the object has not been secured after forty or forty-five minutes' work, it is much safer to discontinue and allow the patient twenty-four or thirty-six hours to recuperate.

6. In the oesophagus, compression of the trachea must be guarded against.

7. In passing the tube every move should be seen and the tube advanced only when the lumen of the trachea or oesophagus is seen to receive it.

Twelve case reports are added. OTTO M. RORT

HEART AND VASCULAR SYSTEM

Birkbeck, L. H. C., Lorimer, G. N., and Gray, H. M. W.: Removal of a Bullet from the Right Ventricle of the Heart under Local Anesthesia. *Brit. M. J.*, 1915, 3, 351.

This patient was seen eight days after the injury. The bullet had passed through and killed a man in front of him. The patient was knocked down, but did not lose consciousness, and had no discomfort other than slight pain from the wound. The wound was about one-half inch in diameter, just below and to the right of the xiphisternal junction. The patient showed no particular symptoms during the first few days, but was kept in bed. The heart appeared to be normal and regular. The radiograph showed that in the lower portion of the heart shadow there was a very sharply defined dark shadow moving with the heart, and also apparently laterally in relation to the heart. By turning the patient over the shadow was seen to be quite definitely in the substance of the heart.

A few days later the pulse began to show some irregularity and the heart occasionally dropped beats, and an operation was decided upon. Veronal, grains 5, was given the evening before, and three doses of morphine, amounting in all to five-sixths of a grain, during the morning before the operation.

Under local anesthesia (eucaine 1 per cent, potassium sulphate .25 per cent, and adrenalin) Gray made a wide horseshoe-shaped incision, convexity upward, extending along the sixth costal cartilage on each side and across the sternum at the level of the attachment of the fifth cartilage. This incision was used so as to make an exposure of the track of the bullet in the depth. The perichondrium was separated from the left sixth cartilage, which was cut across at the costochondral junction and used as a lever to elevate the sternum while the triangularis sterni, pericardium, etc., were being separated off the posterior aspect of the flap. A small portion of the right sixth rib was removed close to the costochondral junction. The sternum, at the lower border of the fifth costal cartilage, was grooved deeply with a gouge and divided with bone forceps. The soft parts were then separated from the sternum and ribs so that the flap could be turned downward and forward. When the flap was pulled forward a hole about an inch long appeared in the pleura on the right side in the track of the bullet. The right lung collapsed. The respiration became labored and quick, the patient coughed jerkily; he became anxious and complained that he was breathless. The color remained good, and he revived in about one minute, after being reassured by the surgeon. Except for this disturbance there was apparently no discomfort during the entire operation.

The flap was held forward by hooks, and the pericardium opened obliquely from the base to near the apex of the heart. About a drum of slightly blood-stained fluid was noticed in the pericardial

cavity. The bullet was felt to be lying, apparently fixed, at the back of the heart, either in the wall or cavity of the right ventricle. The point of the bullet was near the apex of the ventricle. During the manipulation the heart was noticed to miss a beat occasionally when touched at the upper and back part of the interventricular septum.

The right ventricle was seized with a pair of catch forceps near the apex. When it was seen that this caused no disturbance a suture was passed through the adjacent muscles, and thus the heart was held forward. This in no way agitated the patient. On further exploration the bullet was definitely located by probing with a needle, and was thought to be fixed in the right ventricle near the posterior coronary vessels. After manipulation, the bullet was felt to change position and to be free inside the ventricle. It was worked away as far as possible from the coronary vessels and grasped between the thumb and finger. Two stitches were inserted into the muscle wall over the bullet. The wall of the ventricle was incised for half an inch, and the bullet removed with forceps. While the wall of the ventricle was still being held firmly between the finger and thumb the stitches were tied.

On removing the catch forceps there was brisk bleeding, which was stopped quickly by an under-running stitch. The pericardial cavity was wiped free of blood-clot and was filled with normal saline to expel the air; it was then sewed up. The right pleural cavity was next filled with saline and the injured pleura sewed up. While the wound was being closed the chest was aspirated to remove the saline. This aspiration was the only part of the operation which seemed to cause the patient any pain.

The patient was wonderfully comfortable on being taken back to bed, but about four hours after the operation the respirations rose suddenly to 48 a minute, and remained at about that level till he died, except for part of two days when the patient being deeply under the influence of morphine, they dropped to 28 a minute. The patient was much troubled after this occurrence by mucus collecting in large quantity in the throat and the upper part of the trachea. Various remedies were tried for this, with little avail. He took nourishment fairly well. Cardiac stimulants were used after the first two days. He lived nearly four and a half days after the operation.

There was never any indication that the operation on the heart had interfered with its action, which, though quick (average 120 to 130) was remarkably strong up to within a few hours of his death. No dropping of beats was noticed after the operation.

D. C. Ramirez.

Pool, E. H., and Ramirez, M. A.: The Late Results of Cardiorrhaphy. *Am. J. M. Sc.*, 1915, 41, 335.

Pool and Ramirez report a case of cardiorrhaphy in a male, aged 24 years, following a stab. The

patient made a good recovery but three years later he was having dull pain in the cardiac region on exertion, which lasted a few minutes at a time. There was also some shortness of breath on exercising.

The authors collected 21 cases, including their own, from the literature and summarize the late results from the reports or from personal communications from the authors, as follows:

SUMMARY	
Number of cases	21
Age—	
Between 20 and 30 years	13
Between 31 and 40 years	6
Between 40 and 50 years	2
Sex—	
Males	17
Females	4
Cause of wound—	
Stab	15
Gunshot	5
Other cause	1
Site of superficial wound—	
Fourth to fifth left space	15
Above fourth space	6

Time between accident and operation—	
One-half to one hour	6
One to two hours	6
Two to three hours	6
Three to four hours	2
More than four hours	1
Site of heart wound—	
Right auricle	1
Left auricle	4
Right ventricle	5
Left ventricle	11
Post-operative complications—	
Pneumonia	1
Empyema	1
Pericarditis serous	4
Pleurisy (non-purulent)	5
Pneumothorax	1
Marked dyspnea	1
None	9
Material used in suture of heart wound—	
Silk	10
Catgut	1
Chromic	1
Not mentioned	7
Drainage of pleura—	
Yes	6
No	15
Drainage of pericardium—	
Yes	6
No	15

CARL R. STEINKE.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Kraske: Gunshot Injuries of the Abdomen (Ueber Bauchschussverletzungen). *Muenchen. med. W. Anchr.*, 1915, lxii, 1329.

Kraske reports the gunshot injuries of the abdomen that he has seen and treated in the past six weeks in a very well appointed military hospital. Most of them came to him from 10 to 24 hours after the wound; he was able to operate on only one within six hours of the injury. Five came in in a dying condition, and of the remaining 73, 19 had injuries of the abdominal wall only; there were 3 extraperitoneal injuries of the rectum with 2 deaths; 4 ruptures of the bladder, 2 deaths; 8 injuries of the large glandular organs of the body with 5 deaths, and the remainder were injuries of the gastrointestinal tract which are described in detail. In all of the 30 cases of the latter class the injuries were found on operation to be of such a nature that spontaneous recovery would not have been possible. The spontaneous recoveries reported by others Kraske thinks are due to the fact that in these cases there was only contusion of the intestinal wall, and perforation later after there had already been a circumscribed peritonitis; but such cases as this are very exceptional.

Kraske generally made very large incisions so as to examine the whole contents of the abdomen. He performed resection in 4 cases of very extensive and irregular contusion of the intestine; in 2 cases in which the patients were in very bad general condition he had to be content with bringing the much mutilated loops out of the abdominal cavity; in one case he sutured the cæcum, which had a large

hole in it, into the abdominal wound. He irrigated freely to cleanse the abdominal cavity, which was generally soiled with intestinal contents. He generally drained with strips of gauze and tubes. The results were very good in view of the fact that most of the cases were operated upon late. He had 19 deaths and 20 recoveries. Most of the former were in cases where there were multiple injuries and ruptures of the intestine and peritonitis were already far advanced. Of the cases that recovered 7 were operated on within the first 12 hours and 11 within the second 12 hours. Kraske feels justified in recommending operation in abdominal injuries; but he realizes the difficulties to be overcome in carrying out surgical treatment on the eastern front. A. Goss.

Haggard, W. D.: The Application of the Various Theories in the Management of Peritonitis. *J. Am. M. Ass.*, 1915, lxx, 1097.

In general diffuse, suppurative peritonitis, the mortality under any method of treatment is staggering. It is not so much the impotence of our various plans of treatment as the delay in employing them. Everything depends on promptness. It is profitless to consider the cases of this class statistically as the time limit, virulence, and extent of involvement vary so widely. One can never know whether the entire peritoneal membrane is implicated or not. If it is, and sufficient delay has occurred to bring this about, then an enormous death rate is inevitable under any and all known methods of treatment. All cases of peritonitis from perforation of stomach, duodenum, or other hollow viscera by gunshot or stab wounds imperatively require operation within the first eight hours, if possible.

The opportunities for the improvement in the results of peritonitis have never been more satisfactory. Early recognition of its causes is becoming more universal, although it may be admitted that whenever a case of advanced peritonitis, particularly from the appendix, has to be dealt with, it is proof of faulty management up to that time.

The most essential treatment, therefore, with or without operation, is an absolute prohibition of anything whatsoever by mouth, with immediate preparation for operative relief when possible. When for any reason this cannot be done the continuance of this principle with the addition of deep morphinization are the most dependable methods. After operation drainage by the glass tube suprapubically and the employment of the upright posture and proctoclysis are well high routine measures.

The various theories considered can be judiciously employed for the varying manifestations of peritonitis, and by a judicious combination of the plans briefly referred to and the perfection of the technique of each, it is believed that the prevalence of peritonitis by surgical prophylaxis can be greatly reduced, and the percentage of cures when its progress has not been immediately prevented can be very appreciably augmented.

The methods of Oschner, Page, Knott, Crile, and Murphy are discussed. EDWARD L. CORNELL.

Eastman, J. R.: Tuberculosis of the Urachus.
Am. J. Obs., N. Y., 1915, LXXX, 649.

The author finds that in the French, English, and German literature there is but one case of tuberculosis of the urachus reported. He has had a second case and because of its rarity gives this report. Both cases occurred in young women 19 years of age.

The author's patient had a good family and personal history. There were no urinary disturbances. The trouble began ten months before entrance. While working in a garden, pain was felt at a point in the middle of the abdomen between the symphysis pubis and the umbilicus. At this time the patient noticed a lump at the point designated, the size of a small apple. There was not much actual pain or soreness. The mass did not increase in size but the tenderness remained. This condition persisted for three months when a pin-point opening appeared in the middle of the anterior wall half way between the symphysis pubis and the umbilicus. This opening discharged a clear watery fluid for about a week. Then a serous crust closed the opening. The opening again discharged after about a week, continuing to do so for one week and again the crust was formed. This process of closing and opening continued for several months. The size of the tumor did not change, but the tenderness still persisted. There had never been any disturbance of the bladder, intestines, or uterus. The discharge had always been free from odor. The patient was positive that the discharge never had a urinous odor.

The microscopic examination of the ulcerated

area showed several well-developed and characteristic miliary tubercles within it and it was infiltrated with many large, round "epithelioid" cells. The author thinks it probable that this case like that of Briddon and Elliot was one of primary tuberculosis of a persisting patent urachus.

C. H. DAVIS.

Davis, J. D. S.: Moschcowitz' Operation: Inguinal Route for Femoral Hernia. *Tr. South. Surg. & Gynec. Ass., Cincinnati, 1915, Dec.*

In Moschcowitz' recommendation of the inguinal route for femoral hernia he places this operation in the same relationship to femoral hernia that the Bassini occupies to inguinal hernia.

The inguinal attack of femoral hernia has not come into general use because the authors who have recommended it have not given sufficient description to Cooper's ligament. In closing the femoral ring by the inguinal route one must of necessity suture Poupert's ligament to Cooper's ligament. Cooper's ligament is a very thick, very resistant, flat fibrous cord extending from the pubic tubercle to the iliopectineal eminence. It is formed by the fusion of various fascial layers: pectineal aponeurosis Gimbernat's ligament, Colle's ligament, fascia transversalis, and the ligaments of Henle and Hesselbach reinforced by the pectineal fascia. Cooper's ligament is principally developed from the pectineal fascia and consists of that part of the fascia that spreads over the pubic ramus and extends as a flat cord to the iliopectineal eminence.

If the same surgical factors are utilized in femoral hernia that are used in inguinal hernia, relapse would be rare. There are certain erroneous impressions regarding the crural route for femoral hernia that give rise to disaster. The opinion is prevalent that the repair of femoral hernia by the thigh route is a simple operation, that the technique does not require anatomical exposure of the field of operation, and that recurrence is rare.

The statement that femoral hernia does not tend to recur after high ligation of the sac is without foundation. Even with closure of the ring by the operation of Bassini or Fabricius with high ligation of the sac a funnel projection of the peritoneum is always left, which constantly tends to recurrence.

If the same precautions were resorted to in femoral hernia that are utilized in inguinal hernia (high ligation of sac, secure closure of the internal ring from above, and aseptic wound healing) relapse would be as rare as in inguinal hernia.

The inguinal route or approach renders resection and anastomosis a very easy procedure compared to a resection in an operation by the crural route. The supplementary abdominal incisions, so often necessary in resection when the crural operation is made, need not be considered for a moment when the inguinal operation is made.

Moschcowitz reports a case on which he had operated for femoral hernia by the thigh route and secured an apparently satisfactory result. About

a year and a half later he did a laparotomy on the patient and examination within the abdomen revealed a sac two inches deep.

When femoral hernia is attacked by a high incision (inguinal route) anatomic exposure of the femoral ring can be made from above, bringing into view Cooper's ligament, which is utilized in the closure.

In the operation for the cure of femoral hernia by the inguinal route, the skin incision is not unlike that made for the Bassini operation, except when the sac is found adherent, when the incision may be extended down into the thigh so as to give room for extirpation of the sac.

The next step in the operation is that of dividing the aponeurosis of the external oblique in the direction of its fibers. The upper flap of the external oblique aponeurosis, the internal oblique and transversalis are held up by a retractor while a second retractor is placed under the lower flap of the external oblique aponeurosis, which retracted downward brings Poupart's ligament into view. A tape or piece of gauze is passed beneath the round ligament or spermatic cord, and used to retract the round ligament inward, and in case of a male, the spermatic cord is retracted outward which gives a very good exposure of the field of operation, with its floor covered by the transversalis, a thin layer of fascia just over or next to the peritoneum. The transversalis fascia is bluntly divided along the line of the original incision, then picked up by the retractors and held with the other tissues, upward and inward, and outward and downward. This retraction brings the peritoneum with the constricted neck of the sac into view.

The retractor is removed from the lower and outer flap to show the lower cut surface of the transversalis fascia attached to Poupart's ligament and its relationship to the peritoneum. If the deep epigastric artery should run an anomalous course, it will at this stage come into view, and it may be retracted or cut between ligatures.

The sac is retracted with its contents, or if this is impossible Gimbernat's ligament, which forms the sharp margin of the constricting ring, may be cut with a blunt-pointed herniotomy knife. The ligament is in full view which makes it practically impossible to encounter an anomalous obturator artery. If such should occur, it is in view and the hemorrhage can be promptly controlled; but in an operation by the crural route or by the thigh, Gimbernat's ligament must be cut blindly, endangering the obturator artery, from which a hemorrhage may occur that is very hard to control, or the sac may be opened just where it converges from the neck, through which opening the hernial contents may be retracted and placed in the peritoneal cavity, and held by a sponge or pack.

If the hernial contents are adherent to the sac loose in its bed, the sac and contents can be pulled out of the hernial bed, converting a femoral hernia into an inguinal hernia, which makes it a convenient and easy task to deal with the sac and contents.

If the sac is adherent to its bed a pair of artery clamps should be introduced down to the lowest point in the sac, then closed and withdrawn. If the sac does not evert on account of adhesions to the bed in which it lies, the lower skin-flap may be retracted down over the thigh, or the inguinal incision may be extended downward on the thigh over the hernial protrusion, thus enabling the operator to dissect the sac free of adhesions.

The sac is tied off and transfixed beneath the transversalis and internal oblique muscles. It is tied off sufficiently high, and drawn up under the transversalis and internal oblique muscles, so as to provide against leaving a protrusion or dimple or funnel-shaped projection of the peritoneum and acts as a safeguard against relapse. The inner and upper flap is retracted inward and upward, and the outer and lower flap outward and downward, which exposes to full view the femoral ring bounded externally by the external iliac vein, femoral and internal epigastric arteries, anteriorly by Poupart's ligament, internally by Gimbernat's ligament covered by a reflection of the transversalis fascia, and posteriorly by Cooper's ligament.

With a small, curved, blunt-pointed needle, threaded with catgut suture No. 2, Cooper's ligament, which can be seen—a dense, tough, white, glistening fascial membrane—covering the horizontal ramus of the pubis, is pierced just internal to the iliac vein, and then the needle is carried through the lower flap of the transversalis fascia, and the edge of Poupart's ligament. Two or three sutures are now similarly placed internal to the first—the last one and the most internal suture picks up Gimbernat's ligament. Tying all these sutures approximates Cooper's ligament and Poupart's ligament, which effectually closes the hernial orifice.

The operation is now to be completed as though it were an inguinal hernia, by the Bassini method. The internal oblique and transversalis muscles and the flap of the transversalis fascia are sutured *en masse* to the overshelving portion of Poupart's ligament, making a bed for the spermatic cord in the male (the round ligament in the female is never transplanted). The external oblique is next closed over the cord—lapped or imbricated—and the skin is closed with a buried No. 1 catgut suture or with a silk or horsehair buttonhole suture.

GASTRO-INTESTINAL TRACT

Fowler, C. C., Rehfuess, M. E., and Hawk, P. B.: *Gastro-Intestinal Studies; an Investigation of the Gastric Residuum in Over One Hundred Normal Cases.* *J. Am. M. Ass.*, 1915, lvi, 1021.

The authors give a complete survey, chemical and physical, of 100 residuums from normal stomachs, together with a discussion of the different theories on this subject presented in the later literature.

After a short technical description of the methods used and the statistical results obtained in the series, the authors summarize their findings, as follows:

1. The accepted limit of the normal residuum of the empty stomach as 20 ccm. is false. The average in the series was 31.14 ccm. This throws considerable doubt on the value of increased residuum in ulcer cases.

2. The residuum, as found, had in every case all the qualities of a physiologically active secretion.

3. The gastric glands are never inactive.

4. There is a definite relationship between the character of the residuum and the character of the gastric secretory response to a stimulus.

5. There is a constant tendency, from osmotic pressure, towards the formation of a stomach secretion.

6. Both colorless and bile-colored residuums may be found in the same individual.

7. The colored residuums appear more frequently in higher acidities, and vice versa, due to the greater frequency of regurgitation in the former condition, which partially neutralizes the high acid contents.

8. Total and free acidity vary directly with one another. The series averaged 29.9 total acidity and 18.4 free acidity. Hence acid figuring over 70 in an increased residuum is of diagnostic value.

9. There is a definite relationship between the quality of pepsin and the total acidity for low acid values, which disappears as high acid values are approached.

10. Trypsin was present almost constantly and in inverse ratio to the free acidity, due to a more complete pyloric closure in high acid conditions and the destructive action of acid on trypsin.

11. The average cryoscopic index of -0.470 as compared to a blood equivalent index of -0.560 accounts for a tendency of osmosis from the blood into the stomach.

12. High acidities are shown by comparison of cryoscopic index and specific gravity data to be accompanied by a throwing out of an unknown solution of certain molecules.

13. The residuum is one of the highest of body fluids, having a specific gravity of 1.0036, which is not without significance. PHILLIPS M. CHASE.

Eusterman, G. B.: The Essential Factors in the Diagnosis of Chronic Gastric and Duodenal Ulcers. *J. Am. Med. Ass.*, 1914, LV, 1596.

This review is undertaken to emphasize proved clinical factors and briefly to consider various phases of experimental, clinical, and therapeutic advancement in their application to the diagnosis of benign chronic gastric and duodenal ulcers. The author's observations are based on the study of 2,400 cases of gastric and duodenal ulcers operatively demonstrated in the Mayo Clinic from 1900 to 1914, inclusive, with an especial summary of the cases of 1913 and 1914.

DIAGNOSIS

A skillful anamnesis, in the absence of extensive clinical observations or direct roentgenologic evidence of a lesion, is still the most important factor in the differential diagnosis of lesions causing gastric

disturbance. With regard to ulcer, characteristic chronicity or remission of symptoms is readily apparent in the case records in over 80 per cent of all our proved cases. The principles emphasized by Graham since his earliest observations are as effective today as then and are the accepted diagnostic criteria in a large daily experience. Typhic and duodenal ulcers in which complications are not far advanced invariably manifest periodic exacerbations. Seasonal variations, especially of spring and fall, appear in almost 40 per cent of all cases. Nervous and physical fatigue, infection and exposure, dietetic indiscretions, toxic intestinal disturbance, etc., are prominent factors influencing recurrences. Between seizures complete relief from symptoms is the rule although frequently in ulcers situated well up along the lesser curvature remission rather than periods of complete relief may occur. In general the greater number of these patients have had symptoms for from five to twenty years, few less than one, and a constant average of twelve and one-half years. During the period of attack, pain or distress, variable in character and intensity, is the common and constant symptom in nearly all cases.

Of secondary diagnostic significance are the location, type, and area of radiation of the pain. The time of pain and method of its control are of primary importance. The complex of chronicity and periodicity of attacks in which pain or distress and the usual association of symptoms repeated uniformly day by day during the attack and bearing a fairly definite relation to food intake and control is of primary clinical importance in the diagnosis of 80 per cent of cases of uncomplicated peptic ulcers. In the remaining 20 per cent this complex may be irregular, atypical, or almost entirely absent; or the symptoms may be "mixed," owing to coincidence of disease in contiguous organs, which occurs in about 16 per cent of all cases of ulcer. It is this group which often taxes the resources of the clinician, but errors in diagnosis do not easily occur if the possibilities are constantly borne in mind, especially in cases (1) in which a perforative process or a painful spasm simulates hepatic colic, (2) in cases in which ulcers had become chronic and complicated when the first symptoms appeared, and (3) in cases suggesting a malignant process, the result of an extensive ulcer, hemorrhage, cachexia, and perhaps a palpable inflammatory mass.

Clinical differentiation between gastric and duodenal ulcer is extremely difficult and in most instances well-nigh impossible. This has been the opinion of most observers. With great regularity late pain and the nature of hemorrhage in proved gastric ulcer may suggest duodenal lesion. Then, too, not infrequently the earlier onset of pain in some cases of duodenal ulcer suggests gastric lesion. In about 5 per cent of all ulcers coincident lesions in the stomach and duodenum are noted, an incidence which increases the difficulties. In the author's experience and in that of many other observers the roentgen ray is of inestimable value. In this field

it has its most practicable application besides occasionally furnishing the first reliable evidence to indicate the presence of ulcer, but too great reliance must not be placed on this; for, valuable as may be the information afforded by the roentgen examination, it has its limitations. The degree of demonstrability of gastric ulcer is directly concerned with three factors; that is, position, size and depth of the ulcer. The direct sign of irregularity of the gastric contour (niche, accessory pocket) may be wanting in instances in which the ulcer is situated on the anterior wall, high up in the cardia and when it involves the pyloric segment; should it be shallow, "slit-like," it may not be successfully demonstrated. Indirect and auxiliary signs, however, in combination with clinical data, may be helpful in establishing the diagnosis. The strikingly frequent occurrence of bulb deformity or hyperperistalsis with residue in duodenal ulcer is worthy of note from both the point of diagnosis and localization.

The continuous or intermittent presence of altered or fresh blood in the gastric extract, the absence of evidence pointing to gross motor disturbances and the situation of pain and tender point to the left of the median line are strong presumptive evidence of gastric ulcer. Clinically, this general observation can be made: Uncomplicated types of duodenal and pyloric ulcer are invariably clear-cut throughout their life history; the longer the period between intake and pain, the lower the ulcer, as a rule; the more prompt the onset and the briefer the duration of pain, the higher the ulcer. In ulcer of the stomach proper this may not be so clear-cut as in duodenal or pyloric types, nor are the day-by-day symptoms so clearly defined. In ulcers well above the pylorus the symptoms are likely to be continuous, or remissions rather than intervals of complete relief are likely to be noted. The pain is not so often relieved by food; small amounts of food may give relief, while increased amounts may cause distress; more care as to diet is necessary; if bleeding occurs, hæmatemesis predominates; vomiting plays a more frequent rôle even in the absence of obstruction, and affords relief; soda relieves pain when food does not; pain begins earlier, as a rule, often disappearing before the next meal, for obvious reasons, in the absence of stasis or marked hypersecretion. Thus the food-relief is minimized; but pain from one-half hour to two hours after food is quite the rule and is of diagnostic significance. Too much clinical significance cannot be placed on reliable evidence of gross hæmorrhage in the presence of other symptoms characteristic of ulcer. This complication, however, occurs in only about 35 per cent of all chronic gastric and duodenal ulcers. The association of hæmorrhage with the ulcer-complex makes for safe diagnosis of ulcer in 95 per cent of all cases. In 5 per cent of all ulcers there is a silent bleeding type in which blood is regularly found in the stools, but more or less complete absence of other usual clinical symptoms of pain, hyperacidity and food ease. Benign ulcer, unlike cancer, bleeds

intermittently. Positive analysis of occult blood in the stool on limited examination was present in about 25 per cent only of the cases studied. Hæmorrhage has been noted in 2 per cent of all cases of chronic appendicitis associated with marked gastric disturbance, while it is as high as 5 per cent in chronic cholecystitis associated with the gastric reflex. In these cases the hæmorrhage is probably due to primary follicular ulceration of the gastric or duodenal mucous membrane. More extensive observations on the frequency of occult blood, of general blood morphology and its diagnostic significance in ulcer are now under way and will be the subject of future consideration.

Briefly stated, in those organic conditions which most frequently cloud the diagnosis—chronic cholecystitis and cholelithiasis, chronic appendicitis, etc.—we obtain our greatest diagnostic aid from the irregularity of symptoms during the period of attack. This irregularity is chiefly concerned with the time of appearance of pain and the influence of food. Nothing follows in sequence day by day, perhaps due to the fact that the stomach behaves properly unless irritated by the contiguous lesion and this extrinsic lesion is irregular in its influence. Judging from the case records, chronic catarrhal or "strawberry" cholecystitis very perfectly and most frequently simulates the ulcer-complex. The features of chronicity and "spells" (of invariably briefer duration, however) with characteristic pain, hyperacidity, and flatulency having some food relation, the absence of colic, icterus, and localizing signs are not uncommon. In order to lessen diagnostic error, daily clinical observation, repeated gastric analysis under variable circumstances, examination of the feces and, finally, the therapeutic management based on the well-known principles laid down by Sippy may be necessary. It is unnecessary to comment on the importance of having in mind and recognizing these types of chronic painful dyspepsia most frequently having their origin in these extragastric lesions. Of considerable moment, too, is the frequency of lesions coexistent in the gastroduodenal, biliary, pancreatic or appendiceal systems in which disturbances engendered by one may overshadow or make irregular the symptomatology of the other, so that to the conceits of surgery must be left the ultimate diagnosis in too many instances.

Test-meal analysis so essential to gastric diagnosis has also its limitations. In the absence of definite evidence of blood, stasis, hypersecretion in the fasting contents, cardiac obstruction, etc., the findings are of value in so far as they are correlated with the clinical and roentgenologic data. They constitute a link, often a decisive one, in the chain of evidence. The instances of normal or subnormal acid value in the presence of a peptic ulcer occur in about 20 per cent of all cases; on the other hand, hyperacidity and hypersecretion, even stasis of the first degree, are only too frequently associated with functional states, ptosis, and extragastric lesions.

These conditions would soon lead to diagnostic confusion if too much dependence were placed on a single or even a repeated gastric analysis. Again, on account of purely physical conditions a considerable residue may be overlooked as shown by the contribution of Harner and Dodd. This disadvantage can be largely overcome by the use of a lavage tube of proper consistency, calibration, and ample fenestration, such as is now in common use. The researches of Rehfuess and his associates have caused a revision of the estimate of the normal contents of the fasting stomach. In selected cases the fractional study of gastric digestion by means of the same investigators' tube and methods has proved to be of practical diagnostic value. Hypersécrétion is the rule in 10 per cent of cases of gastric ulcer and hypersecretion, also in ulcers at or near the pylorus. These features, singly or combined, are noted in 15 per cent of all duodenal ulcers. A considerable hypersecretion of 200 ccm. or more, likewise the recovery of retention contents of the modified Riegel meal after from twelve to fourteen hours inevitably argues for a lesion or organic stenosis, especially if the findings are constant. The determination of gastric motility is of diagnostic importance second only to secretory function or disturbance, and for obvious reasons the former is of special interest to roentgenologists.

Carmus and Miller conclude that their bariumized carbohydrate meal method is a more sensitive test for gastric motility than the modified Riegel meal as commonly used in the Mayo clinic; that the modified Haschek double meal method is more informative than rubbing after a motor-meal test since the former test only shows delay of evacuation beyond six hours but also yields information as to hypermotile conditions. Their conclusions are based on a comparison of results of both examinations in 950 patients who came to operation. The lesions were as follows: appendix, 125; gall-bladder, 311; gastric ulcer, 109; gastric cancer, 137; duodenal ulcer, 268. Of these patients 200, 21.1 per cent, showed a six-hour barium residue, 131, 13.7 per cent, had food remnants after fourteen hours or longer. The majority, 200, or 20.4 per cent, of the 250 patients showing a barium retention were found to have cancer, or gastric or duodenal ulcer. They further conclude that a distinct residue after six hours from the barium meal given under prescribed conditions was in 90 per cent of instances indicative of grave pathology, and usually denoted obstruction at or near the pylorus.

From personal observation a more sensitive test for motility in this method can be conceded especially in case of intermittent or low-grade retention dependent on pylorospasm, incomplete stenosis, and on lesions of the accessory digestive system. One may add that the comparison of results between the two methods is hardly fair, principally because of difference in the time element and other features which must be taken into consideration. The motor meal under proper circumstances will continue to

be a most practicable index of gastric motility—a fact conceded by eminent roentgenologists and emphasized by clinicians following observations made from the results of both methods. By the latter method one has the additional advantage of being able at the same time to estimate the secretory function of the stomach.

Exclusive of those cases in which a consistent diagnosis of gastric or duodenal ulcer was made and medically treated, there were 1,078 cases operatively demonstrated during the years 1913 and 1914. Of these, 364 were gastric and 814 were duodenal. Coexistent lesions in both organs were noted in 44, or 4 per cent. The average ratio of gastric to duodenal ulcers is well shown in this series, about 1 to 3; that is, 75 per cent of the ulcers were duodenal. Of the 364 cases of gastric ulcer, 171 occurred in males and 93 in females. The average ages were 47 and 44.5 years, respectively. The average duration of symptoms was 9.8 years. In about 80 per cent the course was intermittent, free intervals alternating with "spells" of variable duration, regular (40 per cent), or irregular (40.5 per cent) in frequency. In 50 per cent the complaint was continuous and progressive over periods of from several months to several years prior to operation. Irrespective of the situation of the ulcer, pain appeared within 4 hours after meals in 85 per cent of the cases; in over 50 per cent it was present within 2 hours, in 55 per cent within 3 hours, regarded as constant in 3.8 per cent and irregular in 3.4 per cent. Definite nocturnal pain occurred in only 6 cases, or 2 per cent. Pain was controlled by food or alkalis, or both, in 186 cases. The majority of these, 84 per cent, showed relief after food, while alkalis alone gave relief in 15.6 per cent. There was a fairly definite history of bleeding (hematemesis or melena) in 73 cases, or 27.6 per cent, of this group; about 41 per cent had hematemesis only, 15 per cent melena, while both hematemesis and melena were mentioned in 44 per cent.

Gastric analyses were carried out in 223 cases; 38 per cent of these showed presence of altered blood in the extract. Gross retention was evident in 21.3 per cent. The average total acidity was 54; the average hydrochloric acid was 49. In 18 per cent the acid values were normal or below. The absence of free hydrochloric acid was shown in 23 cases. Under such a circumstance the possibility of carcinoma, syphilis or associated disease was evident. Five of these patients have since died from malignancy, three now apparently show malignancy; in the others the advanced age associated with considerable fresh blood in the extract, gall-bladder disease or other pathologic lesions explained the achylia.

The generally accepted complex of ulcer was more or less definitely present in 34 per cent of the 211 cases; irregular but suggestive in 6.8 per cent; classified as irregular in 5.3 per cent. In the remaining 7 per cent the picture was atypical or the record was incomplete. A primary diagnosis of gastric ulcer was made in 174 cases, or 66 per cent.

an alternative one in 21 cases, 8 per cent. Duodenal ulcer was the primary diagnosis in 47 cases, or 27 per cent. The roentgen ray gave definite assistance in 65 per cent of the 113 cases examined in this series.

The situation of the ulcers was as follows: the lesser curvature in 167 cases, or 63 per cent; the pylorus, 13, or 13 per cent; total ulcers at or near the pylorus, 87, or 33 per cent; posterior wall, 27, or 10 per cent; anterior wall 6, or 2 per cent; 2 gastrojejunal ulcers secondary to gastro-enterostomy. Multiple ulcers were noted in 15 cases, or 5.6 per cent.

The complications were: advanced cicatricial pyloric stenosis, 11.7 per cent; evidence of perforation, 28 per cent; perigastritis with adhesions to neighboring structures, 28 per cent; questionable malignancy, 11.7 per cent; appendiceal disease, 33.7 per cent. In less than 25 per cent of all cases was there no complicating factor, a fact which illustrates the advanced stage of the process at the time of first examination.

Of 814 cases of duodenal ulcers 628 (77 per cent) were males and 186 (22.8 per cent) were females. This characteristic disproportion in sex incidence Wilkie has probably explained on an anatomic basis. The average age was 43 years and the average duration of symptoms was over twelve years. The clinical course was intermittent in 95 per cent of all cases, and periodic in 50 per cent. Continuous preoperative complaint of variable duration was noted in 26 per cent. In more than 85 per cent the pain appeared in from two to five hours after taking food; in the remainder it appeared within two hours. Nocturnal pain only was noted in 6 cases or 7 per cent. Definite relief by food was noted in 67 and partial or irregular relief in an additional 15 per cent. Relief by neutralization was present in 39 per cent. Hemorrhage was reported in 208 cases, or 25 per cent, and was classified: melena, 8.8 per cent; hematemesis, 6 per cent; both melena and hematemesis, 10.5 per cent. The acid values averaged 20 per cent higher than in gastric ulcer and in only 7 per cent were they below the accepted normal standard.

A primary clinical diagnosis was made in 543 cases, or 66.7 per cent, and an alternative one in 67 cases; that of primary gastric ulcer in 88 cases, or 10.8 per cent. This totaled 85.7 per cent, the usual average in all the series recently studied. Of 251 cases in which the tentative diagnosis of gall-bladder disease was also made, 51, or 20 per cent, showed this disease present and 51 ulcers, 22.3 per cent, were shown to be chronic perforating. Reviewing the case histories, the ulcer complex was fairly regular in 71 per cent, suggestive in 7.2 per cent, and irregular in 13.2 per cent.

At operation advanced pyloric stenosis was shown in 251 cases, 30.8 per cent; perforation in 26.8 per cent; periduodenal inflammatory disease in 23.5 per cent. Associated disease in the appendix occurred in 48 per cent; in the gall-bladder in 0.7 per cent.

A more detailed comparative study of the statistical end-results in these two groups serves to bring out the salient differential clinical features as previously mentioned.

Mayo, W. J.: Gastric Ulcer. *J. Am. M. Ass.*, 1915, lxx, 1069.

Gastric ulcer is a more serious condition than duodenal ulcer, but fortunately not so frequent. The statistics of the Mayo clinic show 27 per cent gastric ulcers to 73 per cent duodenal. The large majority of so-called pyloric ulcers are in reality duodenal. Ulcers in the terminal inch and a half of the stomach will probably be mistaken for carcinoma on account of the palpable tumefaction due to oedema and muscular hypertrophy. Acute perforating gastric ulcers are less liable to be protected by adhesions and the escape of gastric content will probably be great, readily diffusing itself over the peritoneum. The perforation is difficult to close. Hemorrhage in gastric ulcer is somewhat more frequent than in duodenal ulcer and is more serious.

Ulcers in the stomach create deformities which interfere seriously with gastric motility and digestion and in a considerable percentage of cases are followed by carcinoma. Statistics on this cancer question derived from autopsies are of very little account in settling the matter; only those cases in which the entire diseased part can actually be removed at operation being of value for study. The prevailing scepticism on this point is not justified by the facts and tends to the prolonged medical treatment of chronic cases, which, if the carcinoma liability were understood in addition to the ulcer risk and disability, would be more promptly treated by the surgeon. Opinions as to the medical cure of ulcers are usually erroneous and based on the frequent cessation of symptoms with or without treatment.

When supposedly cured cases are operated on during the quiescent interval the ulcer is not found to be cicatrized, but unhealed. Roentgenograms show the same condition. Of the four means of diagnosis, the history is first, the roentgenogram second, the physical examination including the use of the stomach tube is third and of great value, while the laboratory examination is a poor fourth. The large majority of ulcers occur in the terminal two inches of the pyloric end and should be resected after the Rodman method. Ulcers of the lesser curvature and antrum are best subjected to Balfour's method of cautery excision and gastro-enterostomy. In posterior ulcers of the body of the stomach, the transgastric excision gives good results, but where great deformity exists with extensive adherent ulcer craters of the posterior wall, removal of the entire pyloric end and union between the stump of the stomach and the side of the jejunum, end-to-side, is indicated. Hour-glass stomachs can be treated by gastrogastrostomy after Watson; by plastic operation of the Finney type of gastroduodenostomy, or by the sleeve resection. This latter method is very effectual.

Ochaner, A. J.: *The Relation Between Gastric Ulcer and Cancer.* *J. Am. M. Ass.*, 1913, lxx, 1073.

During the past ten years the author has personally studied all cases of cancer of the stomach removed in his clinic, with a view to determining whether its beginning was in the margin of an ulcer, and in all of the cases not too far advanced for reliable observation he has been able to find evidence of the previous existence of an ulcer. In the late cases neither positive nor negative evidence could be found.

Regarding the evidence from the history, from previous diagnosis from those treating the case, and from laboratory findings, he found that one who is thoroughly careful in his search for all facts which have a bearing on the fact that cancers are implanted on ulcers can always elicit from the patient by careful cross-examination a sufficient amount of evidence in the history to support this position, while if one must depend on the facts put down in the ordinary history written by house officers, whose attention is not centered on this feature, one will be disappointed in his search for typical ulcer symptoms.

His observations seem to warrant the following conclusions:

1. In all of the recent or early cancers encountered, the growth was located in the edge of an ulcer.

2. By careful study of the history of late cancer, in which the original ulcer had, of course, been obliterated by the growth, it was possible to elicit a previous ulcer history.

3. In studying the development of cancers in other parts of the body, a point is usually found which has been subjected to long-continued irritation, as in the lip, face, rectum, or uterus.

4. The fact that there are so few cancers of the duodenum as compared to cancers of the stomach can be explained by the fact that, while there is stasis in the stomach, there is none in the duodenum. In other words, while food containing the cancer germs will remain in contact with the ulcer of the stomach sufficiently long to permit the germs to become implanted, this is not the case in the duodenum.

5. It is possible that these germs may require an acid medium to stimulate them to attack the tissues.

6. It is relatively an easy matter to overlook the history of a previous gastric ulcer, because in the absence of severe hyperacidity the pain in these cases is frequently not sufficient to be remembered through the great distress from which the patient suffers after the cancer has developed.

7. It is usually found that a large majority of these patients have habitually eaten large quantities of food which was certain to be infected with menses, such as lettuce, celery, radishes, etc., so the introduction of the cancer germ into the open wound of the ulcer could easily be explained.

8. These gastric ulcers are of such long duration that the focus of irritation might readily serve to locate cancer germs which might have entered the circulation through some other portal.

9. This does not indicate that every patient who has ulcer of the stomach will ultimately have cancer any more than that every soldier going to war will be shot, but it shows the wisdom of closing this opening for the entrance of cancer by curing the ulcer early and permanently.

10. Much attention should be given to the early history of these cases and to the prevention of feeding unclean, uncooked food. EDWARD L. COOPER.

Finney, J. M. T., and Friedenwald, J.: *Experiences with Gastro-Enterostomy; a Study of One Hundred Cases as Compared with a Similar Number of Cases of Pyloroplasty.* *Am. J. M. Sc.*, 1913, cl, 479.

The authors have collected 100 cases each of gastro-enterostomy and pyloroplasty in order to compare them in detail and to determine whether any advantage really exists in favor of the latter.

The largest number of cases of gastro-enterostomy occurred between the thirtieth and sixtieth years, while those of pyloroplasty occurred between the thirty-fifth and fiftieth years. There were 36 males and 44 females in the former series, with an average duration of symptoms of nine and one-half years, while in the latter there were 63 males and 37 females with a like average symptom duration, although the greatest duration was 25 years as against 10 years in the first.

In the gastro-enterostomy series pain was present in 90 per cent; vomiting in 65 per cent; hæmatemesis in 23 per cent; melena in 44 per cent; and retention in 36 per cent. In the pyloroplasty series pain was present in 92 per cent; vomiting in 64 per cent; hæmatemesis in 21 per cent; melena in 46 per cent; and retention in 42 per cent. Also, in the former there were 46 cases of gastric ulcer and 38 duodenal ulcers against 55 cases of gastric ulcer and 32 duodenal ulcers in the latter series.

In 67 of the cases in the gastro-enterostomy group with obstruction, 44 were due to gastric ulcer, 14 to duodenal ulcer, and 9 to adhesions. In 64 of the pyloroplasty group, 51 were due to gastric ulcer, 7 to duodenal ulcer, and 6 to adhesions.

After gastro-enterostomy, immediate success was obtained in 82 per cent; while, after pyloroplasty, 99 per cent were successful. In both groups there were 4 cases in which secondary operation was required to correct immediate difficulties. There were 7 deaths following gastro-enterostomy and 5 deaths after pyloroplasty.

In 77 cases of gastro-enterostomy, after 1 year the results were satisfactory in 84.3 per cent, while in 82 cases of pyloroplasty after 1 year the results were satisfactory in 95.9 per cent. Final results in the first group showed a percentage of 77.3 per cent satisfactory recoveries, and in the latter 88.6 per cent.

The authors conclude that the immediate and final results are clearly in favor of pyloroplasty; that gastro-enterostomy is indicated where the duodenum is too densely adherent to be mobilized and where the pylorus is thickened and infiltrated from hypertrophic ulceration; that gastro-enterostomy be limited to relieving stenosis of pylorus due to malignancy; and that pyloroplasty and pylorotomy are far safer and more satisfactory procedures.

P. M. CHASE.

Sturgis, M. G.: Congenital Intestinal Anomalies.

Surg., Gynec. & Obst., 1915, xxi, 447.

Congenital intestinal anomalies, while rare, are becoming more important to the abdominal surgeon, especially so on account of the increasing use of the X-ray in diagnosis. There are three classes; viz., stenosis and atresia, diverticula and cysts, and malpositions.

1. Stenosis and atresia present many forms: diaphragms, complete membranes, strictures of varying size to complete obliteration, and occasionally the complete severance of the intestinal canal, with only fibrous connection between the two closed ends. The duodenum is the most frequent site—about 35 per cent of all cases recorded. Stenosis alone is frequently found in the lower ileum in the situation of Meckel's diverticulum, with which it is sometimes associated. In this situation it is not incompatible with long life. In the duodenum, atresia is much more frequent than stenosis, the common site being in the vicinity of the biliary papilla and the duodenojejunal junction. This is probably from a persistence of the normal occlusion found in embryos of from 7 to 15 mm. In the jejunum and ileum, embryological occlusion does not normally occur; and, if found, is the result of developmental defect, according to one school, or to the existence of adhesion from prenatal peritonitis.

2. There are two types of true diverticula: one having at its apex an accessory pancreas is found in all portions of the intestine; the other, Meckel's diverticulum, is found in 2 per cent of humans in the lower ileum on an average of 50 cm. from the ileocecal valve. It presents a wonderful variety of forms—a thimble-like projection, a patulous duct extending to the umbilicus, or a fibrous cord weaving among the intestines. With both attachments severed, it becomes the most prolific source of congenital cysts. These may be found within the mesentery and their contents may be clear, sanguineous, or chylous. Cysts may also arise from snared-off portions of the intestines, cases having been reported arising from the duodenum and jejunum.

3. Maldevelopments and malpositions include cases of absence of the cæcum and ascending colon, and cases of absence of the ileocecal valve also.

Malpositions result from the failure of the intestines to follow the usual course of their development, with the arrest of some portion at some point short of the normal one.

The author describes two cases: the first, an atresia of the ileum in a newborn baby; the second a failure of the colon to rotate, in which case also the small intestines lay apparently in a prolongation of the lesser peritoneal cavity which communicated with the greater not only through the foramen of Winslow, but also through an extensive opening extending from the right iliac fossa to the promontory of the sacrum.

Popper, H.: Roentgen Diagnosis of Intestinal Perforation (*Die Diagnose der Darmperforation mit Hilfe der Roentgendurchleuchtung*). *Deutsche med. Wochenschr.*, 1915, xl, 1034.

The diagnosis of stomach and intestinal diseases by roentgen rays has made great progress since the introduction of the use of bismuth for that purpose. The results of roentgen examination of the other abdominal viscera were less satisfactory until the plan was recently conceived of introducing gas into the large intestine or into the peritoneal cavity, thus bringing out the outlines of the liver and spleen.

When the gas is introduced with the patient standing it collects at the highest point in the abdominal cavity under the dome of the diaphragm, pushes the liver and spleen down and gives a very characteristic, clear, sickle-shaped, bright zone. In all diseases in which gas collects in large quantities in the abdominal cavity this phenomenon is often observed, and it is an early symptom of perforation. Popper describes an illustrative case. When the patient is shaken there is a wavelike movement of the gas or fluid. This phenomenon is observed, not only after perforation of ulcers of the stomach, duodenum, and intestine, but after injuries of the intestine and after perforating appendicitis. It is always an early symptom. As the prognosis is better the earlier the operation, this sign should always be looked for in doubtful cases. A. Goss.

Abbott, A. W.: The Early Diagnosis of Intussusception in Children Under Three Years of Age. *Tr. West. Surg. Ass., Des Moines*, 1915, Dec.

As children under three years of age have too little intelligence to describe their symptoms, a knowledge of their clinical behavior is most important. Twelve children, three years of age or under, were under observation and the following conclusions reached:

1. A sudden violent abdominal pain, accompanied by a regurgitation of its stomach contents, in a child otherwise well, initiated the attack in 100 per cent of the cases.

2. Recurring pains, varying in intensity but regular in periodicity accompanied by the assumption of peculiar positions, generally the prone, in those strong enough to move about, occurred in 100 per cent of those noted. In cases beginning in collapse, 25 per cent, these periodic pains were often indicated only by regularly repeated moans and drawing up of the limbs.

5. An abdominal tumor could be made out somewhere in the course of the colon in 92 per cent.

6. The stools contained no faeces in 91 per cent of the cases.

7. Mucous stools are recorded in 84 per cent of cases.

8. The above indications should strongly suggest intussusception within 48 hours after the attack.

9. Blood in the stools adds to this certainty of diagnosis, but it may be absent in 77 per cent until after the second day.

10. Instead of distention we may expect a flaccid, scaphoid abdomen.

11. Recurring vomiting is usually not one of the earliest symptoms, being absent in 81 per cent until the second day or later in the author's cases, and in exceptional cases there is no vomiting.

12. The positive identification of the intussusception by the finger in the rectum is absolutely pathognomonic, but may be demonstrable in only 55 per cent.

13. The virulence of the disease and its mortality depend not so much upon the time elapsing before operation as upon the intensity of the strangulation of the mesenteric circulation. This observation is supported by the following mortality account: (1) Of the 12 cases, 8 recovered, 4 died; (2) of the non-collapsing cases, 8 recovered, 1 died; (3) of those beginning to collapse, none recovered, 3 died.

14. To prevent all cases the earliest possible diagnosis and operation is imperative.

Bainbridge, W. S.: Chronic Intestinal Stasis. Tr. Am. Ass. Genes. & Obs., Pittsburgh, 1915, Sept.

Bainbridge traces briefly the evolution of the theory of the genesis and development of chronic intestinal stasis, as proposed by Sir Arbuthnot Lane, and emphasizes the difference between this complex condition and that which has been called "old-fashioned constipation." The underlying or primary causes of chronic intestinal stasis, the immediate or secondary causes, and the immediate and remote results of the condition are discussed, the cases are classified, and the treatment of each class outlined.

The purpose of this contribution, however, is avowedly "to add to the evidence a few cases which seem to indicate the far-reaching importance of chronic intestinal stasis as a factor in the production of pathological conditions hitherto not definitely associated with the drainage scheme of the body." While it is not contended that the cases of the mild and the mid-group categories are to be ruthlessly subjected to radical surgical procedures, such as ileocolostomy, or ileocolostomy with colectomy, the fact remains that many cases reach the advanced degrees of stasis whether or no, and must be treated as such. Cases have multiplied in increasing proportion as time and experience have progressed, which illustrate the advanced stages to which chronic intestinal stasis may reach, rendering the patient a pitiful spectacle of general misery and unfitness.

It cannot be stated on what borderline of disease such patients may stand, nor can it be determined just when the line has been passed, beyond which the individual enters another realm of disease and suffering. Lane's contentions with regard to the causative association of chronic intestinal stasis and certain other diseases, notably tuberculosis and cancer, may not be accepted, but it has not been unambiguously demonstrated that there is no such relationship. The experience of Lane and his co-workers with cases in which various so-called end-result conditions have been palliated or cured, by ileocolostomy or colectomy, have been paralleled in the author's experience regarding certain forms of mental and nervous affections, particularly epilepsy.

In his work as visiting surgeon to the New York City Children's Hospital and Schools on Randall's Island, as well as in private practice, Bainbridge has long noted the connection between what he formerly considered as constipation and certain forms of mental and nervous diseases, notably epilepsy. He repeatedly observed marked improvement of symptoms, and, in mild epilepsy, a lessening in frequency and severity of the attacks, following a thorough clearing out of the alimentary canal. Ten years ago, when he became interested in the study of chronic intestinal stasis, and began to apply his findings to the patients on Randall's Island, he became more strongly convinced than ever that much could be done for these patients through the correction of defects in the drainage scheme of their bodies. Subsequent experience has verified this conviction. Among the end-result cases reported in this paper cured or markedly improved, by overcoming the chronic intestinal stasis, are epilepsy, probably *pari passu*: general nervous and physical invalidism extending over many years; chronic pancreatitis, obstructive jaundice, gallstones, and non-malignant ulcer.

In conclusion Bainbridge emphasizes the fact that chronic intestinal stasis is primarily a condition which is entirely amenable to dietetic, hygienic, and medical treatment, and should not, therefore, be so generally considered as coming entirely within the category of a surgical affection. If, however, through neglect or improper treatment the individual case is no longer amenable to preventive measures and those which come within the province of the internist or the gastro-enterologist, conservative surgical procedures may be employed, especially in milder cases. Unfortunately, however, many cases progress to a more advanced stage before relief is sought, and in such cases it may be necessary to resort to the more radical surgical procedures, such as ileocolostomy or colectomy. From the cases cited, and many others in his own experience and that of others, he concludes that there is reason to believe that chronic intestinal stasis plays an important part, either in initiating or in augmenting, many conditions which were formerly not associated, from the etiologic point of view, with perverted function of the gastro-intestinal tract.

These far-reaching possibilities should be borne in mind by practitioners in every field of medicine and surgery.

Williams, R. B.: Chronic Intestinal Stasis as Produced by Obstruction at the Ileocecal and at the Hepatic Flexure. *Ann. Surg.*, Phila., 1915, lxi, 326.

Williams discusses the cause, symptoms, and treatment of chronic intestinal stasis due to obstruction at the ileocecal region and at the hepatic flexure, and reports 19 cases.

The causes are purely mechanical, usually at or near the ileocecal valve, or at the hepatic flexure of the colon, and may be corrected or removed by surgical measures. Near the ileocecal valve the obstruction may be due to a Lane kink, an adherent appendix, an unduly developed ligament of Treves with fixation of the appendix, to gross adhesions involving small intestine, cæcum, and omentum, and in the ascending colon or at the hepatic flexure to a Jackson's membrane, to angulation of the flexure by a membrane binding together the ascending and transverse colons, to a freely movable and prolapsed cæcum, and in either region to multiple adhesions following acute inflammation or operations.

The symptoms and signs of chronic intestinal stasis are: attacks of abdominal pain usually referred to the epigastrium or right iliac region, not associated with the taking of food and with or without vomiting; local tenderness; constipation alternating frequently with a mucous diarrhœa; a sensation of distention by gas; symptoms of intestinal auto-intoxication; and stagnation of bismuth at certain points in the intestinal canal, as shown by radiographs after a bismuth meal. The symptoms may be toxic or obstructive.

The treatment may be medicinal, mechanical, or, in the majority of cases, operative. In early cases careful regulation of diet and administration of liquid petrolatum may suffice. In more advanced cases, these measures combined with the application of a supporting belt may entirely relieve the symptoms. The operative treatment consists in transverse division of abnormal bands, removal of the appendix, separation of all abnormal adhesions, etc., as the case may be. In all cases margins of divided membranes are well covered with vaseline to prevent further adhesions.

Williams reports 19 cases with radiographs. The operations performed were as follows:

Appendectomy.....	1
Appendectomy and division of Jackson's membrane.....	2
Appendectomy and division of ileopelvic band.....	4
Appendectomy and division of Jackson's membrane and fixation of cæcum mobile.....	1
Division of adhesions of omentum and ileum to cæcum.....	1
Appendectomy on account of well-developed ligament of Treves.....	2
Division of adhesions of cæcum to parietal peritoneum and of omentum to cæcum and parietal peritoneum.....	1
Division of Lane's band and appendectomy.....	3

Separation of adhesions of omentum to right iliac fossa, to parietal peritoneum external to ascending colon, and between caecum coli and right iliac fossa.....	2
Division of Lane's band and membrane stretching from ascending colon to transverse colon.....	1
Division of band from right iliac fossa to mesenteric border of ileum.....	1

All cases were discharged cured with the exception of one in which an appendectomy and division of a Lane band was done. O. R. SEVIX.

Gibbon, J. H.: Typhoid Perforation. *Ann. Surg.*, Phila., 1915, lxi, 385.

Gibbon presents an analytical study of 139 cases of typhoid perforation together with 16 supposed cases occurring in the Pennsylvania Hospital from 1901 to 1915.

In this period, 5,891 cases of typhoid fever were treated, with 481 deaths. There were 139 cases of perforation, 112 of which were operated upon; of these, 27, or 24.1 per cent, recovered. During the period from 1909 to 1914, there were 15 operations with no recoveries, while in 1915 there were 10 operations with 5 recoveries. Gibbon believes this situation is due to the fact that in the 15 operations, the average time ensuing between first symptoms and operation was 20 hours, while in the last series of 10 operations the average time was 10 hours. He emphasizes the point that every hour after the onset of perforative symptoms is valuable and that delay is always fatal.

A detailed clinical report is given of 16 cases in which a diagnosis of perforation was made, but not confirmed at operation. The most striking feature in this series is that only 2 died after exploration, where no cause of symptoms could be found. Acute appendicitis was found in 3, and 1 recovered. In another case hæmorrhage probably produced the symptoms. This case recovered. Again, the pain, tenderness, and rigidity were found to be due to salt solution introduced into the abdominal wall. In another with a diagnosis of acute appendicitis, a preperforative stage of ulceration was found.

In the 27 cases of perforation not operated on, 7 were suspected but operation postponed as useless because of the patient's condition. Lung conditions varying from bronchitis to tuberculosis caused the largest number of diagnostic errors. Hæmorrhage stood next in order, while in but 3 instances was the error to toxæmia or delirium. P. M. CHASE.

Smythe, F. D.: Typhoid Perforation, Peritonitis; Report of an Unusually Interesting Case. *Tr. South. Surg. & Gynec. Ass.*, Cincinnati, 1915, Dec.

Typhoid fever is disgracefully prevalent in the United States. Five hundred thousand persons are annually infected, and of that number forty thousand die. One third of all the deaths from typhoid are due to perforation — peritonitis.

Hospital statistics show a mortality of more than 2.5 per cent from perforation. There is no means of determining the per cent of deaths from perfora-

tion from typhoid in private practice. Perhaps, however, it is not quite so high as in cases treated at the hospitals.

More than half of the perforations occur during the third week of the disease. Perforation may occur, however, as early as the last of the first week or as late as the second month.

The period of greatest danger is the third week.

A complete record of the clinical course of the case should be kept so that the attendant's attention will at once be fixed upon any variation, however slight. Symptoms suspicious of perforation appearing, a surgical consultant should be summoned at once. Delay in so doing until the next regular visit, or for the appearance of pathognomonic evidence, is inviting disaster.

Severe pain in the abdomen after the tenth day is a symptom suggestive of perforation.

Thorough physical examination should be made at the earliest possible moment. In the event of abdominal rigidity, an operation should be performed at once. In the absence of abdominal rigidity, constant vigil should be kept, and total white and differential count made at hour intervals for six to eight hours.

Symptoms subjective and objective pathognomonic of perforation and peritonitis are:

Subjective—

1. Pain in the abdomen—usually in the hypogastrium or right lower quadrant.

2. Pain, most severe in the hypogastric region, in the majority of cases of typhoid perforation, though it may be, and often is, located elsewhere.

3. Pain is persistent, increasing in severity, often shooting and paroxysmal.

4. Nausea with or without vomiting.

5. Urgent desire to go to stool, efforts often ineffectual, neither flatus nor feces passing—copious fecal rate.

6. Vesical tenesmus, very common though not so pronounced as intestinal torms.

Objective—

1. Patient restless—facies denote physical distress, forehead moist, large drops of cold sweat often present.

2. Position in bed indicative of effort on the part of patient to relieve tension.

3. Palpation reveals rigidity pronounced, if not general, rapidly increasing and soon becoming rigid.

4. Tenderness upon pressure everywhere, most pronounced at or near the site of perforation.

5. Temperature and pulse altered but little if any, immediately after perforation occurs. Generally slight acceleration of the one and lowering of the other, both variable, and too much importance should not be attached to pulse or temperature.

6. The blood count is of no value immediately after perforation unless the patient's blood had been repeatedly examined for some hours prior to the suspected perforation.

Positive indications for operation are:

1. Typhoid after first week, usually the third, with sudden pain in abdomen, severe, persistent, growing progressively worse—muscle spasm.

2. Pain, at first local, rapidly extending, with or without nausea and vomiting.

3. Tenderness upon pressure, local and general.

If the above findings exist preparations for operation should be begun without delay, regardless of the pulse rate, temperature, or blood findings. The sooner the operation is performed the better for the patient, as in gunshot wound perforations.

Operation should be performed in hospital cases within from one-half to two hours after perforation occurs. Operations performed within that period may be classed as early operation. Operation four to eight hours after the occurrence of perforation in hospital cases is late operation and is evidence of inexcusable delay.

Early operation would result in reversal of the recovery and death-rate; that is, it would read 80 to 20 and not 20 to 80, our present statistics.

The author reports a case of typhoid perforation with an unusual and interesting history. The patient, a male, aged 41, had had no previous illness, except chicken pox and measles in childhood. Five years ago he developed a hernia, right inguinal, incomplete; never strangulated or irreducible.

While engaged in a friendly wrestling match he experienced sudden and severe pain in the hypogastrium extending upward and outward toward the right quadrant. Excruciating pain was followed almost immediately by copious vomiting. There was urgent desire to go to stool, but no gas nor feces passed. He collapsed while at stool, and was carried to his home. He continued to suffer pain in the abdomen, most marked near the symphysis pubis.

When seen by his physician, two hours later, his temperature was 99.8°—pulse 74.

The diagnosis was acute peritonitis, and he was referred to the hospital for operation. Seven hours after the onset of trouble he entered the hospital. Temperature 100°, pulse 84, complained of severe abdominal pain; was nauseated but did not vomit.

The blood count, made while preparation for operation was going on: Pulse 84, total white count not submitted. The clinical diagnosis was peritonitis, secondary to perforation of hollow viscera.

Under ether anesthesia a right rectus incision was made. Upon entering the cavity a dark offensive fluid escaped. The intestines were distended and very red; numerous flakes of fibrin were present. The appendix was examined at once; no trouble of consequence found, though engorged. Examination of the ileum disclosed perforation near the jejuno-iliac junction. A single perforation about the size of a pin-head was found, and was sutured at once. After through-and-through marginal serous reinforcement was secured, the cavity was wiped out carefully, and provision for drainage made with four large tubes, one directed upward

toward either flank, emerging through stab wounds, the other two directed downward to the bottom of the pelvis, emerging through the lower end of the incision.

The progress of the case was satisfactory, and the patient was discharged cured on the fifteenth day.

Bailey, F. W.: Pseudomucinous Cysts of the Appendix and Ruptured Pseudomucinous Ovarian Cyst. *Tr. South. Surg. & Gynec. Ass., Cincinnati*, 1915, Dec.

Bailey reports two cases of pseudomucinous cysts of the appendix, one case complicated by ruptured pseudomucinous ovarian cyst.

The uncomplicated case was present in a young man, aged 25, who had undergone a drainage operation for acute suppurative appendicitis thirteen months previous. There had been at intervals a mucopurulent discharge from the sinus which persisted since the first operation. He had suffered several attacks simulating acute appendicitis and lost weight rapidly.

The patient had a temperature of 100°, and there were local signs of acute appendicitis. Operation revealed a clubbed appendix with constriction one inch from the tip. A smooth-walled, spherical tumor, which proved to be a pseudomucinous cyst, had pushed its way through the wall of the appendix. Between this tumor and the tip, the lumen was patent for the distance of one centimeter. Between the tumor and the cæcum, the lumen was patent and undergoing an acute inflammatory process, accounting for the acute symptoms. The appendix and distal loop of the ileum were surrounded by the omental sac and bathed in pseudomucinous exudate. The appendix was removed, the pocket sponged and treated with 3 per cent iodine. The sinus was dissected and the wound closed without drainage. Recovery was uneventful, no symptoms remaining.

The second case was that of an ovarian cyst, with a capacity of 4 liters, which had evidently ruptured several weeks prior to operation, with no definite symptoms except general abdominal tenderness and rapid loss of weight. About 2 liters of pseudomyxomatous material was removed from the abdominal cavity, large masses having adhered to the abdominal viscera. The appendix was 7 cm. long and 2.5 cm. in diameter. The wall was translucent, smooth, tense, and fluctuant. There was a small opening near the tip, from which gelatinous material exuded. The contents of the ovarian tumor and appendix proved to be pseudomucin.

The pathological matter was removed, the abdomen thoroughly irrigated with saline, and the opening closed without drainage. The patient had right-sided inguinal hernia which was repaired under local anesthesia on the tenth day. She was discharged from the hospital thirty days from the date of entry, and has improved in health steadily since.

Recently published articles by Castle, Phemister,

and E. G. Lewis are cited as presenting up-to-date knowledge of pseudomucinous cysts. Bailey emphasizes as essential conditions for their development: (1) gradual obliteration of a portion of the mucous tract; (2) sterilization of the mucus-lined tract distal to the obstruction, calling attention to the fact that the process of occlusion must be sufficiently slow so that drainage into the cæcum is not obstructed until the peritoneal contents of the lumen are inactive.

Enlightenment on the method of growth of the contents of such a tumor after its departure from the mother cyst and attachment to the peritoneal surface would be a valuable contribution and the author cites two cases in which yeast cells were demonstrated in pseudomucinous cysts, adding that their presence while probably accidental, justified careful future observation. There is no record of malignancy following ruptured pseudomucinous cysts of the appendix but the danger is far greater in those of ovarian origin. There is no diagnosis of the condition recorded previous to operation. The author believes protection against such tumors lies in the early exploration of all surgical abdominal lesions.

Hofheimer, J. A.: Appendicitis. *Internat. J. Surg.*, 1915, XXVIII, 311.

Hofheimer claims that the situation of the mouth or cæcal end of the appendix is such that it may become distended by intestinal gases, especially if under compression, such as during constipation or in intestinal stasis from any cause; and thus becoming dilated it readily admits particles of fecal matter or other infective material into its lumen. The weak muscular coat, unable to eject these foreign substances, allows them to remain in the organ and permits their arrest at any point in the appendix, and at this site an inflammation sets up, which tends later to ulceration, abscess formation, gangrene, or perforation.

Meanwhile other changes are going on outside of the appendix which cause an increase in leucocytosis and of lymph exudate, helping to wall off the diseased organ, thus offering a protection to the general economy. That more lives are not lost before operative measures are instituted is mainly due to this effort of Nature to seclude the offending member while undergoing these severe pathological changes.

The location of pain varies in the individual cases, and is not always located at "McBurney's point." It is in cases of chronic recurrent attacks that adhesions, kinks, and malpositions occur, and the tendency to ulcerative and gangrenous conditions are mainly found; and the diagnosis is often rendered difficult on account of the varied location of the pain. It is also in those patients whose symptoms are at variance with the normal location of the appendix, that we find the greatest variety of complications, and these add to the doubtfulness of the prognosis, and should cause the consultant

to explain to the patient the urgent need of operative measures.

The author cites cases, in one of which the pain was in the right heel; another where the gangrenous appendix was found in a hernial sac; others with various adhesions, and containing concretions.

He advises washing out pus cases with a solution of tincture of iodine, 10 to 25 per cent, in sterile water at blood temperature; keeping the patient in an extreme "Fowler's" position, with ample drainage. For stimulating peristalsis after operation, especially when tympanitis is present, the hypodermic use of eserine sulphate, 1-100 grain every three hours as required, has proven efficacious in his hands.

Early operation is the only safe dictum in appendicitis.

Schrup, J. H.: Left-Sided Appendicitis. *Surg., Gynec. & Obst.*, 1915, xvi, 442.

The author reports an operated case of left-sided appendicitis without a transposition of viscera, which gave the history of the clinical findings of an ordinary and usual chronic right-sided appendix case. He also reports a second case in which the primary symptoms indicated right-sided appendix but which later proved to be a left-sided abscess formation.

The anatomic condition of the first case is demonstrated by post-operative skilagrams; the latter is not demonstrated and the author thinks it likely that it was a right-sided appendix which perforated at the tip toward and to the left of the median line, but a skilagram would be necessary to determine accurately as to the condition. Schrup wishes to emphasize how unexpectedly one may find these conditions and therefore the necessity of all surgeons knowing, being acquainted with all the possible localities of the oftentimes elusive appendix. With this object in view he tries to simplify the subject by a classification of the various cases reported in the literature of the last hundred years. These cases are grouped under the two general headings, anatomical and etiological.

The etiological group is divided into seven more or less chemical causes: (1) non-rotation of colon, (2) retention of fetal colonic mesentery, (3) elongated appendix, (4) fetal inflammations, (5) arrested descent of testicle and ovary, (6) adhesions, and (7) other etiological conditions (syphilis, work, diet, etc.).

The anatomical is divided into the six most usual anomalous locations and relations of the colon and its attached appendix: (1) left-sided colon, (2) right-sided colon, (3) herniated colon, (4) varum in pelvis, (5) double intestines, and (6) complete transposition of viscera.

The author also reports that the literature case reports of a complete transposition of viscera is much more frequent than reports without a transposition and relates that 26 of the former were reported during the last four years. He thinks that

with our modern bismuth diagnosis more of these anomalous colonic conditions should be disclosed.

Anderson, H. B.: Appendicitis as a Sequela of Tonsillitis. *Am. J. M. Sc.*, 1915, cl, 541.

The author views the literature bearing on the subject and cites cases to illustrate the close relationship between tonsillitis and appendicitis. He cites numerous conditions, such as endocarditis, pneumonia, thyroditis, cholecystitis, etc., which have been shown to be traceable to tonsillitis. He gives credit to Kelynack, 1891, for having first pointed out the association of appendicitis and tonsillar infections. Anderson's case proved fatal because of apparent misleading symptoms. The following is a brief synopsis of the case:

A male, aged 19, was admitted January 10, 1915, with acute follicular tonsillitis. On January 13 he developed severe epigastric, gastric distention, and belching of gas. There was no tenderness nor rigidity anywhere else. The pain disappeared and for two days the patient was apparently much better. January 15, the pain recurred at 10 o'clock a.m.; his temperature was 98°, pulse 84. During the night he had severe pain; his temperature rose to 99.2°, the pulse to 140. The next morning he was operated upon and a general peritonitis was found to have been caused by an acute appendicitis.

Anderson advises (1) the importance of bearing in mind the possibility of appendicitis following tonsillitis; (2) that the appendix involvement is only a part of a general infection, hence the gravity of the case is out of all proportion to the symptoms; that chronic tonsillar infections should be kept in mind as possible causes of appendicitis. *Isidor Com.*

Kroher, K.: Drainage in Peritonitis After Appendicitis (Beitrage zur Frage der Drainage bei Peritonitis nach Appendicitis). *Deutsche Zeitsch. f. Chir.*, 1915, cxxxv, 297.

Kroher gives a very exhaustive and thorough discussion of the subject, giving a review of the literature, the conclusions to be drawn from the 11,000 cases observed at the Leipzig Clinic, and also the results of experiments made on rabbits to determine the question of drainage in peritonitis. Unfortunately the results are not commensurate with the great amount of time and labor expended. The experiments were valueless because it was found to be absolutely impossible to produce a diffuse suppurative peritonitis in rabbits by any method.

As a result of his study of the Leipzig clinical material Kroher comes to the conclusion "that the impression gained from the work of skilled surgeons at the Leipzig Clinic is that drainage in diffuse suppurative peritonitis has by no means justified the hopes that were based on it." As the results are so meager it scarcely seems worth while to repeat the details of the experiments and the tabulated results of the clinical cases, which are given in the original. The most interesting and valuable part

of the article is the review, which covers in a very thorough manner all the literature of the subject and presents it in a very concise and readable form. The opinions as to the value of the procedure differ very widely and the question of drainage still remains unsolved. There is a bibliography of 191 titles.

A. Goss.

Hirschman, L. J.: Present Status of Local Anæsthesia in the Surgery of the Lower Bowel. *Proctologist*, 1915, IX, 160.

Local anæsthesia is advocated in all cases in which unconsciousness of the patient is not essential. The principles to be observed in all operations under local anæsthesia are the conservation of the patient's peace of mind and the prevention of pain during and after operation.

The preparation is the same as for general anæsthesia, except that morphine, gr. 0.25, and chloroform, gr. 15 to 20, are given with milk or coffee one and one-half hours before operation and a hypodermic of morphine, gr. 0.25, is given one-half hour before operation.

The author describes in detail his technique of injecting the anæsthetic in various types of cases. The solutions used are β -eucaine lactate (1 per cent) and quinine and urea (0.5 per cent). It is claimed that every rectal operation with the exception of those for extensive fistula and for dense rectal strictures or cancer can be most satisfactorily performed under local anæsthesia provided the surgeon be familiar with the correct technique.

The lessening of shock; prevention of post-operative pneumonia and nephritis; shortening of stay in hospital; and the comfort of the patient are the chief points in favor of local anæsthesia.

LISTER TUHOLSKI.

Black, J. C.: Intersigmoid Retroperitoneal Hernia. *Surg., Gynec. & Obst.*, 1915, XVI, 527.

The above is one of the rarest forms of hernia. It is of such rarity that J. B. Murphy in the August, 1914, clinics reports a case and says that Moynihan claims that there have been only two other cases reported in the entire medical literature previous to this. The interesting point about this case was that the tentative diagnosis was made previous to operation from the symptoms, the main features of which were: First, the history of a fall immediately followed by pain in the left iliac region which radiated to the back. Second, pain was relieved when the patient was lying on the right side but began again when she stood or assumed the left prone position. Third, constipation was another marked symptom.

The patient was a married woman, aged 34 years. Her family and personal history were negative. About two years previous when the patient was about seven months pregnant she had fallen on the sidewalk alighting squarely on the buttocks. She was immediately seized with a sharp pain in the left iliac region which radiated to the lumbar region of

the spine and down the left groin. After this fall she was never free from pain more than a day or so at a time and was never able to lie on the left side, as shortly after assuming this position the pain began. She was always troubled with constipation and often after taking an enema the pain would be relieved for a time. At no time was a tumor felt.

These symptoms continued until December 8, 1914, when an operation was performed. A small sack was found between the two peritoneal layers of the mesentery of the sigmoid. This was dissected out and the opening closed with silk suture, after which the patient made a good recovery and has since been free from pain.

Lockhart-Mummery, P.: The Prevention of Fistula in Ano. *Lancet*, Lond., 1915, CLXXIX, 745.

Fistula in ano is in the great majority of cases an entirely preventable condition, provided that the abscess which nearly always precedes it is treated correctly in the first instance. It is true that in a few cases a fistula forms as the direct result of a fissure, without any real abscess formation, and this may sometimes be observed to take place.

Fistula nearly always results from an abscess in the neighborhood of the anus, and if this abscess is properly treated when it first makes its appearance it will generally heal without the formation of a fistula. Unfortunately, what usually happens is that the abscess is allowed to reach a considerable size before it is opened, and it either bursts its way into the bowel at the upper level of the external sphincter, or the tissues between it and the mucous membrane are so thinned as to render the subsequent formation of a fistula inevitable. There are several reasons why such abscesses are not opened early. The most important is the fact that an abscess in the cellular tissue around the anus does not, in the early stages, cause the ordinary signs associated with abscesses in other parts. The abscess generally begins either immediately below the mucous membrane or immediately beneath the skin, but as there is no deep fascia to limit it, it does not cause external swelling until it has reached a considerable size. The skin around the anus is thick and tough, so that the abscess tends to spread in the loose cellular tissue rather than toward the skin. The ordinary signs of abscess, such as redness, swelling, and heat, will not be obvious until the abscess is comparatively large. The only early signs of abscess in this situation are pain and local tenderness, often accompanied by a certain amount of malaise and a heightened temperature. This is the stage at which the abscess should be opened, and at which, if it is opened, a subsequent fistula can be prevented. At this stage in the formation of the abscess no swelling will be obvious, and there will be little if any redness of the overlying skin. If, however, when these symptoms are complained of a finger be passed gently into the anus and the parts carefully palpated between the finger and thumb, induration will be felt, accompanied by

marked tenderness on pressure. These signs are quite sufficient to warrant an incision, and the proper treatment is to administer an anesthetic without delay, and under proper aseptic precautions to introduce a knife through the skin some little distance away from the edge of the anus and incise the indurated area.

A small drainage tube should be inserted and attached to the edge of the skin. The drainage tube should not be long and should not go to the bottom of the abscess, but should merely be sufficient to keep the skin edges apart and allow the free evacuation of the discharge from the area of inflammation. The patient should subsequently be treated by frequent fomentations and hot baths two or three times a day, the tube being removed in about 48 hours, provided the discharge has ceased. If such treatment is carried out promptly and thoroughly the abscess will almost certainly subside, like any other abscess, and without the subsequent formation of a fistula.

It is hoped that the time will come when abscesses in the neighborhood of the anus will be incised as soon as they are suspected. At present the history of a case of fistula is always the same: pain, and tenderness in this region coming on suddenly; fomentations administered by the doctor for some days, with consequent relief from pain; then the opening or bursting of a large abscess, which fails to heal completely and becomes a fistula.

D. C. BALFOUR.

LIVER, PANCREAS, AND SPLEEN

Babcock, W. W.: Cholecystectomy and Cholecystic Toxemia. *J. Am. M. Ass.*, 1915, lvi, 1428.

In a personal experience of 270 operations on the gall-bladder and ducts, 37 ectomies were done before 1912, with 19 deaths, a mortality slightly over 51 per cent. In 38 ectomies before 1912, there were 4 deaths, a mortality of 7.8 per cent. In 121 ectomies performed since 1912, there were 2 deaths, a mortality of 1.6 per cent. In 42 ectomies since 1912 there were 4 deaths, or about 9 per cent mortality. Before 1912, gangrenous and suppurating gall-bladders were usually removed; now they are usually drained under local anesthesia. The stage in which the operation is done has even a greater influence on the mortality than the type of operation. In 124 cases of ectomy in the first stage of cholecystitis, irrespective of date or technique, the mortality was 0.88 per cent. In 191 operations in the second stage, 67 being ectomies, there were 4 deaths, a mortality of 3.0 per cent; while after 64 operations in the third stage of cholecystitis, there were 18 deaths in which the operation or biliary condition was a factor, a mortality of about 28 per cent. Thirty of these patients had acute gangrenous or suppurative cholecystitis, 7 an acute pancreatitis with fat necrosis. Twelve had primary or secondary operations for duct obstruction, fistula or duct or intestinal anastomosis. In only one patient was carcinoma observed, and this in-

volved the ducts. In 2 cases, intestinal obstruction from gall-stones existed. In another case an intestinal perforation had been produced. One death resulted from diabetic coma and one from pulmonary embolism. It is evident that the stage of the disease is more important than the type of operation in determining the operation.

The author's conclusions are as follows:

We consider inflammations of the gall-bladder as bacterial infections of childhood or early adult life, as progressing for years, during which time secondary metastatic, toxic, or reflex symptoms only are observed, as later having a second stage in which there are attacks of colic due usually to the presence of gall-stone, as having usually after 20 or 30 years a third stage of serious complications, such as duct obstruction, pancreatitis, perforation, abscess, or gangrene. We consider surgery as working, for the most part, far behind the pathology of the disease, and believe there is wide need for earlier intervention, so that the patient who starts at the age of 12 or 15 with cholecystitis and dyspepsia may not at 35 have gall-stone colic and may not at 65 succumb to cholecystic gangrene or pancreatitis. We consider external biliary drainage undesirable, as a rule, except in late or complicated cases, an early cholecystectomy being the operation of choice. Unfortunately, technical dangers make uniform success after cholecystectomy uncertain in the hands of the average surgeon. Despite this, the mortality of cholecystectomy in the first stages of cholecystitis is much less than cholecystostomy in the last stages of this disease, so that the results of a surgeon may depend more on when he operates than how he operates. The morbidity depends on how he operates.

EDWARD L. CORRELL.

Buchanan, J. J.: End-Results of a Series of Three Hundred Operations on the Gall-Bladder. *Surg., Gynec. & Obst.*, 1915, xlii, 499.

Buchanan reports the end-results of 300 consecutive operations on the gall-bladder. He was able to follow all but 18 of these cases, 94 per cent. The general mortality was 4.6 per cent. Nine-five per cent of cases were drained and only five per cent primarily excised. The following are his conclusions:

1. Cholecystotomy is not a satisfactory operation, giving but 81.7 of ultimate cures, taking the cases as they come. (This percentage of cures is not materially different from the results reported from many large clinics.)

2. Cholecystectomy, it is believed, would not be a satisfactory operation if employed in all cases by operators of ordinary skill and perhaps even by the most skillful surgeons.

3. The personal equation enters so largely into this question that it must be conceded by the advocates of cholecystectomy as well as by the followers of cholecystostomy, if any still exist, that the practice that is safe for one operator is unsafe for another.

4. As a surgeon's experience increases and as he honestly follows his cases and considers their con-

dition he is more disposed to turn to cholecystectomy, he should realize, however, that the too hasty adoption of this course may be attended with an increase in his mortality list.

5. There is a field for both operations and those surgeons will have most success who will not only consider the condition of the patient but estimate justly their own capabilities.

Horn, H. W.: Situs Viscerum Inversus with Gall-Stones. *Ann. Surg., Phila.*, 1915, lxii, 424.

A case of this rare condition is reported by Horn, together with a fairly exhaustive review of the literature which shows but 9 cases on record.

The key-note of the differential diagnosis is the coexisting cardiac transposition which is always present. The X-ray will reveal, also, a complete transposition of abdominal viscera.

The author's case was that of a female aged 51 years, who had suffered 30 years with left hypochondriac pain, which had increased during the past year. The pain was located under the left costal arch, radiated to the left shoulder blade and over the left half of the abdomen. It was frequently accompanied by nausea, but never by jaundice, and bore no relation to digestion; the stools were normal, with bowels constipated. Dyspnea was marked, but there was no loss of weight.

The patient's past history showed no typhoid, but repeated tonsillitis and some rheumatism. Menopause occurred four years before. She had had four full-term uncomplicated pregnancies.

The patient was of small stature, poorly developed, and no jaundice. There was marked tenderness under the left costal arch, on deep inspiration, with the lower liver margin two fingers below the arch. There was absence of normal cardiac dullness and apex beat, but they were found on the right side of the chest. The blood showed slight leucocytosis while the urine showed a trace of albumin with a few hyaline casts; systolic blood-pressure 130.

Through a left rectus incision, the gall-bladder was easily found, free of adhesions but with thickened walls. About 70 ccm. of greenish-black bile was aspirated and four mulberry stones removed. The ducts were free; the gall-bladder was drained and the abdomen closed. Recovery was uneventful, and a year later the patient reported freedom from left hypochondriac distress but complained of slight epigastric pain.

P. M. CHASE.

Sprunt, T. P.: An Occasional Feature in the Pathology of Splenomegaly. *Bull. Johns Hopkins Hosp.*, 1915, xxvi, 316.

The author gives the pathological report of a spleen in a case of splenomegaly. The patient, a white male, aged 30 years, complained of splenic anemia. He gave a positive alcoholic and luetic history. After an attack of "malaria" in July, 1911, his spleen remained large. He had recurrent convulsive attacks from November, 1912, to May, 1913, and a severe attack of pain over the liver in

May, 1913. He was given a thorough course of quinine, mercury, iodides, and sodium cacodylate without apparent effect on the size of the spleen.

Examination revealed a moderate pigmentation of the exposed parts, pyorrhea alveolaris, a scar on the penis, a very large spleen, and a small liver. There was no general glandular enlargement; the urine was normal; blood-pressure 115 mm. Hg.; temperature 98 to 100° F.; pulse-rate normal; Wassermann negative; von Pirquet tuberculin test positive; erythrocytes 2,500,000; leucocytes 1,160; hæmoglobin 40 per cent. Differential count: polynuclears 73.6 per cent; eosinophiles 2.4 per cent; basophiles 0.8 per cent; small mononuclears 15.2 per cent; large mononuclears 6.4 per cent; transitionals 1.6 per cent.

Splenectomy was performed June 30, 1913. Recovery eventually followed. The spleen was found to be adherent to the tail of the pancreas 22 x 9 x 13 cm., and firm. The cut surface was dark greyish red, smooth, with widely spaced malpighian bodies and prominent trabeculae in which were scattered here and there ochre-colored patches 1 to 3 mm. in diameter and surrounded by a purplish zone.

Microscopically the ochre-colored patches consisted of narrow golden or hematoxylin staining bands arranged concentrically in the walls of small vessels having a diameter of from one-tenth to one-sixth of a millimeter and, in addition, of broader similar bands less regularly arranged in the nearby trabeculae. Between these coarse strands, fine yellow or dark staining filaments formed a delicate network. All this material stained readily in the tests for iron; it was easily dissolved and disappeared from the sections when treated with dilute mineral acids or stronger oxalic acid, leaving a hyaline area which stained very poorly, gave the so-called "elacin" reaction of Unna, but did not take the usual elastin stains. By first treating sections with potassium ferrocyanide and hydrochloric acid and then staining with orcein, the iron-containing tissues were colored blue and the elastic tissue a silky brown, and such preparations showed very well the apparently normal brown fibers running over into the wavy blue fibers, which still retain some of the characteristic morphology, but are continuous with the dark blue, straight, broken bands in the center of the lesions. The transition is especially well shown in the fine filamentous network, where the two stains can be seen coloring the same fiber in different parts of its course.

O. R. SEVIN.

Blake, J. B.: Banti's Symptom-Complex with Relation to Splenectomy. *Ann. Surg., Phila.*, 1915, lxii, 315.

The author gives the indications and contraindications for splenectomy in cases of splenic anemia.

Banti's symptom-complex progresses slowly in the majority of cases and terminates fatally in

practically all cases. Most physicians agree that it is only cured, and permanently, by early operation. Failure to diagnose splenic anemia is due to the fact that the spleen must be increased to about three times its normal bulk before it can be palpated, and to lack of careful and extensive examination.

Blake advises that splenectomy in splenic anemia or Banti's symptom-complex should be recommended under the following conditions: First, in adults, when the diagnosis is agreed on by a good physician and a competent surgeon. Second, when the condition of the patient is sufficiently good to

withstand what may be a serious operation, or when a poor condition can be sufficiently improved by one or more transfusions previous to the operation. Third, in children, only after a thorough trial of all possible medical methods of treatment including fresh air, sunshine, careful nursing, liberal and appropriate diet, as well as the judicious use of drugs. In a large majority of cases, a high white blood count, or a considerable recurring or continuous fever are contra-indications. In children also the agreement of physician and surgeon is an essential pre-operative requirement. O. R. SEYB.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS. CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Cotton, A.: *Limitation of the X-Ray in Diagnosis of Certain Bone and Joint Diseases.* *Am. J. Orth. Surg.*, 1915, vol. 217.

Cotton discusses and illustrates with X-ray pictures five bone and joint diseases as follows:

1. Tuberculous osteo-arthritis, which may show rarefaction, erosion, new bone formation, sequestrum, and abscess formation. The whole picture is "fuzzy" or "woolly." In the synovial type the plate may be negative or may show bone atrophy or joint effusion. Tuberculosis probably does not occur in the diaphysis.

2. Infectious osteomyelitis, which shows a mottled appearance at one or both epiphyseal ends, and extending along the shaft may end abruptly at the epiphyseal cartilage with new bone formation at the periphery.

3. Syphilis, which shows an irregular epiphyseal line denoting an epiphysitis, a thickened periosteum, and new bone formation, but no rarefaction or "fuzzy" appearance. Gummata may produce localized softening with periosteal thickening or destruction.

4. Sarcoma, which shows in the round-cell type a definite dark area, as though a piece had been bitten out, and in the giant cell type a softening of the central portion with expansion of, and new bone formation in, the periosteum for a capsule.

5. Bone cyst, which also shows a dark area, and periosteal bulging, but not the trabeculae seen in the sarcoma cavity.

Cotton concludes that though the X-ray is invaluable and sometimes pathognomonic, yet it does not always give a true picture of the nature and extent of the disease, thus necessitating the addition of clinical data.

ROBERT G. PACKARD.

Allison, N., and Moody, F. F.: *Osteochondritis Deformans Juvenalis (Perthe's Disease).* *Am. J. Orth. Surg.*, 1915, vol. 217.

In this disease is found a peculiar condition showing a definite disturbance of growth in the upper

end of the femur during its period of greatest bony growth. The author has shown that the chief symptoms are a limp, slight limitation of motion, especially in abduction, and slight atrophy of the glutei on the affected side. The X-ray findings are definite. The epiphysis at the head is flattened and there is a breaking up into spots or gaps of areas of the head of the femur and epiphyseal line. Adaptive changes are shown in the acetabulum, usually resulting in a widened socket. Boys are more often affected than girls, the onset being between the fourth and twelfth year. The tuberculin and Wassermann tests are all negative in these cases. Trauma is a strong etiological factor.

The authors have shown that the disease follows a rather definite course in that it requires one to one and a half years to terminate. Little or no pain is experienced. The ultimate result is a shortened and much thickened femoral neck, a broad flat femoral head, and a lessened femoral angle — coxa vara of a slight degree.

A few cases are cited, all having similar histories, symptoms, and terminations. The point of injury seems to involve the artery supplying the epiphyseal head which passes into the posterior portion of the capsule and also through the ligamentum teres. The softening of the neck and head causes great deformity of the femoral neck, if weight is borne on the leg. The general treatment advocated is immobilization with little or no weight-bearing. The use of a spica bandage with the use of crutches and the wearing of a high shoe on the opposite foot are recommended.

H. W. MALTER.

Ross, W. L.: *Rickets.* *N. Y. M. J.*, 1915, vol. 500.

The author presents a very complete article on the modern etiology and treatment of rickets. Rickets is a nutritional condition due to some derangement of the metabolic processes. It usually attacks infants between the ages of three to eighteen months. It is most frequently observed among the poorer classes, especially among those who are artificially fed. Italian and Negro children are especially prone to the condition.

All tissues of the body are affected, but the osseous

system in the greatest degree. There is congestion of the bone, periosteum, and cartilage followed by excessive growth of cartilage cells with imperfect calcification. The lessened amount of mineral salts and the still less perfect bone formation render the bones unnaturally soft and deformities are readily induced by the following forces: (1) underlying growth of soft tissues; (2) atmospheric pressure; (3) muscle force; (4) superimposed weight of the thorax.

It has been found that the water content of rachitic bones is higher than normal. The most important change in these bones is demineralization, especially in calcium and phosphorus.

As to its etiology, the underlying cause is not known. Improper food, protracted nursing, and poor hygiene are the most commonly accepted causes. Dietetic disturbances, especially poor fat and protein digestion, play a very important rôle. Experimental evidence seems to show that disturbances of internal secretions, especially of the thyroid and thymus, may cause rickets.

The earliest diagnostic symptoms of rickets are sweating about the head, craniotabes, constipation, and irritability. In the later stages the bony manifestations such as rachitic rosary, Harrison's groove, large fontanelles, delayed dentition, and deformities of the long bones become apparent. Muscular weakness, enlargement of the liver and spleen, pot belly, etc., belong to this later stage. Where complications do not exist, the prognosis is good.

For the prevention of this disease it is advisable that all mothers during pregnancy and the lying-in period should be allowed a generous diet, and that the mother should nurse her offspring if it is thriving. When artificial feeding must be resorted to, the cleanest raw milk and simple, uncomplicated formulas should be employed. In the earliest stages of the disease, regulation of the diet and the addition of orange, prune, and pineapple juice may bring a happy result. Small doses of phosphorus are usually beneficial. Older children should be given animal and vegetable broths, eggs, and cereals. The use of thyroid extract and adrenalin have been recommended. During the acute stage of the disease when the bones are soft the children should be kept off their feet, and when deformities occur the cases belong to the orthopedic surgeon.

DEFOREST P. WILLARD.

Outland, J. H., and Glendening, L.: *Sarcomatous Proliferation (Sarcoma of Rib) in a Traumatic Tumor Sixteen Years After Its First Appearance*. *J. Am. M. Ass.*, 1915, lvi, 1177.

The authors cite the case of a man, aged 36, who received a trauma which resulted in the appearance of two small tumors over the region of the ninth rib. These tumors had been present sixteen years, when a sarcoma of the rib beneath them resulted. October 3, 1913, operation was performed under gas-ether anesthesia, and a mass, comprising part of the

ninth and tenth ribs, was removed by resecting these ribs without opening the pleura. A small plaque of growth on the pleura was revealed just under the site of the growth on the ribs, and necessitated the opening of the pleura for its removal. The two small tumors previously mentioned were seen to be purplish encapsulated masses in the muscle and subcutaneous tissue, and were easily removed.

Pathologically the material consisted of: (1) parts of two ribs united by a hard, dense, white fibrous growth, the size of a man's hand, and (2) two small lumps of tissue, which were soft and were encapsulated everywhere by a membrane as thick as the dura mater. On section, both of these showed the structure of a small round-cell sarcoma. The sarcoma from the ribs was interlaced with fibrous strands, while the small tumors were almost free from connective-tissue framework.

Certain points in connection with this case are emphasized. First, the identical structure of all these tumors: the original tumors and the new tumor on the ribs are all the same kind of sarcoma. Second, the complete encapsulation of original tumors. Third, the fact that they had been present for sixteen years without pain or growth.

The question arises whether they were sarcomata from the start, that is, whether they were the original focus of sarcoma, or whether they simply suffered in the general sarcomatous degeneration in the region. Whether, in short, the sarcoma was primary in the ribs or in these small tumors. Whoever defends the hypothesis that it was primary in the ribs will have to take into consideration the necessity for an explanation of the fact that a sarcoma developed at the exact site of a trauma received sixteen years previous. CHARLES J. JACOBS.

Leuf, A. H. P.: *Injuries to Bone at Tendon and Ligament Insertions Without Local Tenderness*. *N. Y. M. J.*, 1915, cli, 850.

The author believes that in many seemingly slight injuries to ligament and tendon insertions to bone, which have been treated and are apparently well, the symptoms often recur due to a more severe injury than was at first supposed. The absence of tenderness is not proof positive that there is no injury at the site of pain. He advises rest in the acute stage and electricity and massage later.

J. R. MARTIN.

Risley, E. H.: *The Common Shoulder Injuries*. *Boston M. & S. J.*, 1915, cliiix, 418.

The author has studied in all 450 cases of shoulder injuries. In this article he deals only with arthritis due directly or indirectly to trauma. He emphasizes the fact that often seemingly trivial or slight bone injury may be productive of very painful incapacity of long duration, especially if an early diagnosis is not made. In all his cases nerve involvement was rare. The shoulder-joint is one which is capable of more speedy recovery than the weight-bearing joints of the body. On the other hand,

in shoulder injuries the extent of the bony lesion by no means determines the severity of the immediate symptoms of sequelae. Shoulder injuries group themselves into extra-articular and intra-articular lesions. The most common injury is simple contusion from falls or other external violence. The severe bruising of the greater tuberosity of the humerus is particularly painful, troublesome to treat, and slow to recover. These cases often develop a bursitis in about one to two weeks after injury. Sprain or insertion fracture can be accurately diagnosed only by the systematic and careful employment of the X-ray in all sprains.

Subacromial bursitis practically never develops as the result of severe direct injury to the bursa alone, but is the result of severe injury to other parts. Nearly 60 per cent of subacromial bursitis are of the occupational type. The treatment is rest in mild cases; change of occupation, when possible, in the more persistent cases not cured by rest. In the stubborn cases and in those who are unable to change their occupation, excision of the inflammatory tuft is the only means of giving sure relief.

The diagnosis of ruptured supraspinatus tendon should not be made until at least three months of non-improvement have elapsed. Several cases of this type have been operated on and have been afforded relief from long standing disability.

For recurrent dislocation of the shoulder anterior capsulography should in a large number of cases give satisfactory results.

Arthritis of the acromioclavicular joint is practically always of traumatic origin and may be entirely a solitary condition and not associated with arthritis in the shoulder-joint or elsewhere in the body. Occupational pain *per se* in the shoulder does not exist.

The prognosis in most cases of ruptured brachial plexus is not good. However, the author believes that with earlier operation more cases will be benefited.

R. O. RITTER.

Churchman, J. W.: The Treatment of Joint Infections by Lavage and Direct Medication. *Ann. Surg. Phila.*, 1915, Jan., 409.

The author reports a careful study of the bactericidal properties of gentian violet and of the use of that dye as an irrigation in the treatment of infected joints. An apparatus is described by means of which a joint may be filled with any desired liquid, emptied and filled with successive solutions as often as desired, with one introduction of the trocar. This consists of a closed sterilized system of bottles containing salt solution, 2 per cent novocaine solution, and 1:1000 gentian violet, and connected with a compressed air tube through a bacteria-proof filter.

The joint is filled with novocaine first as a local anesthetic; this is then withdrawn and salt solution introduced, followed after withdrawal by the gentian violet. The dye is allowed to remain as long as desired. The necessity of such an apparatus was

realized when it was observed in animal experiments that the dye when placed in contact with mucous surfaces did not penetrate on account of the mucous secretion, and some means had to be devised for thoroughly cleansing the joint before applying the gentian violet.

Careful animal experiments were carried out before an attempt was made on the human. It was found that the dye could be introduced into the blood stream of rabbits, and in those which survived there was a bactericidal property imparted to the blood, lasting, however, less than an hour. Emulsion of micrococci aureus previously stained with gentian violet and injected into the veins of rabbits had no effect, while the same emulsion unstained cause septicemia and death. The toxicity of anthrax was so much reduced by staining that death was delayed nearly a month in white mice, which are almost instantly killed by ordinary anthrax. This property of the gentian is selective, as was found by bacteriological study, and there is a sharp line between the violet positive organisms which will not grow in the presence of the stain and the violet negative ones which are not affected. Most of the violet positive species are also gram positive.

Photographs are shown of cultures on agar plates, one half of the plate being stained with gentian violet and the other half left plain. Inoculating strokes across the two halves of the plate resulted in growth only on the unstained half if the organism was violet positive and the dividing line was absolutely sharp. Crystal violet, methylene violet (B. magenta, rosaniline, pararosaniline, dahlla, and parafulchin were found to possess the same selective action as gentian violet. W. A. CLARK.

Rand, C. W.: Hysterical Joint Neuroses, with Especial Reference to the Hip; Report of a Case Simulating Fracture of the Neck of the Femur. *Surg., Gynec. & Obst.*, 1915, III, 489.

The author is impressed with the relative infrequency of hysterical hip-joint neuroses. From a careful review he reports 22 cases, 17 occurring in females, 5 in males.

Especial emphasis is placed upon differential diagnosis. With the patient deeply anesthetized, the neuromimetic joint moves freely, and limitation of motion is not evidenced until full consciousness is restored. In organic joint disease passive motion may be unlimited under surgical anæsthetic, but muscle spasm intervenes before consciousness returns, thus eliminating voluntary protection. Brodie's sign, i.e., cutaneous hyperæsthesia, with relative articular analgesia, usually prevails in hysterical joints, but a skiagraph should always be taken.

The author's case is that of a woman of twenty-four who fell on an icy pavement, striking her right hip. She was disabled completely. Examination showed signs so closely simulating those seen in fracture of the neck of the femur that this diagnosis

was tentatively made. A Buck extension was applied. Skiagraphs of the hip and femur proved negative. Two weeks later she suddenly presented unmistakable hysterical manifestations. A diagnosis of hysterical hip-joint neurosis was made, and later sustained when, on being assured that her hip was sound, she volunteered, and successfully attempted, to walk. Only a few steps were taken; the following day more; while on the third day (sixteen days after injury) she walked without a limp, all painful symptoms having disappeared with a return of function.

Taylor, H. L., and Frieder, W.: Quiet Hip Disease. *Am. J. Orth. Surg.*, 1915, xiii, 192.

"Quiet hip" is a benign and fairly common occurrence in healthy children, probably following trauma. It shows a mild insidious invasion, followed by very slight lameness and often is without pain. Examination early shows very moderate limitation of motion, absent or slight joint spasm, and very little if any shortening. The X-ray shows irregularity of the epiphyseal line, flattening and thinning of the epiphysis sometimes creeping over the neck to touch the trochanter, roughened acetabulum, and short thick neck. The cases progress to a cure with but the simplest treatment and show no toxæmia, glands, abscess, deformity, ankylosis, or disability. The etiology is not clear, but it is not luetic or tuberculous. ROBERT G. PACKARD.

Henderson, M. S.: Some Mechanical Derangements of the Knee-Joint. *Intern. M. J.*, 1915, xiii, 871.

Henderson discusses internal derangement of the knee-joint due to injuries of the semilunar cartilages, or to loose bodies arising within the joint. The injury is usually due to a forcible wrench of the tibia outward on the femur when the knee is a little flexed and the foot abducted and everted. Loose bodies may originate from such direct trauma, but also possibly from degenerative changes in the synovial membrane. These loose bodies obstruct motion and cause irritation and effusion. In many cases tuberculous infections of the knee-joint arise from such damage to the internal semilunar cartilage. If the primary injury or fracture of the meniscus is not at once treated, there usually results an effusion and often an arthritis, with or without "locking" and consequent pain. X-rays are valuable because whereas the normal semilunar does not cast a shadow, a loose one may, on account of the calcium deposited.

Of 52 cases operated on in the Mayo clinic for a damaged internal semilunar or a loose cartilage, no case showed a damaged external semilunar. The operative results were not satisfactory in 22 cases for various reasons: associated arthritis, excessive trauma to ligaments, and unnecessary removal of the cartilage. Six cases are described.

Henderson concludes that semilunar cartilages should be removed only when definite pathology is

present. Small incisions, the least trauma possible, and rigid asepsis should be strictly carried out. The best incision is along the internal condylar line.

ROBERT G. PACKARD.

Davidson, A. J.: Tuberculosis of the Patella. *N. Y. M. J.*, 1915, cii, 833.

The rarity of primary tuberculosis of the patella is shown by the few (30) case reports and the scarcity of literature on the subject. The variance of opinion regarding trauma as an etiological factor in bone tuberculosis is noted. The frequency with which the patella is subjected to such factors would lead one to suspect its frequent involvement by tuberculous infection. However, it has been suggested that sesamoid bone and lack of capillary loop circulation, etc., in a measure explain its less frequent primary involvement. The tubercle bacillus is carried in all probability by the blood and lymph stream in most bone infection from the mucous membranes, though sometimes it is transmitted by direct contact.

The author's case was a male, aged 22 years, with negative family, and no traumatic, history. He was admitted to the hospital 30 days from the onset of the disease with swollen painful right knee held in slight flexion, tender to motion and tender to pressure over the inner side of the knee. The Wassermann test was negative, the tuberculin test positive. Aspirated fluid showed no bacteria.

Operation was performed through an incision to the outer side of the patella. The sequestrum as shown by X-rays was removed and the cavity curetted from the inner aspect of the joint. Most of the medullary cavity was involved. The reddened sigmoid was trimmed off and the joint washed out with hot saline and a small gutta-percha drain left in three days. In nine months the result was perfect, as shown by X-ray and a clinical picture. The importance of early diagnosis is emphasized.

H. W. MEYERDING.

Hartzell, T. B.: The Clinical Type of Arthritis Originating About the Teeth. *J. Am. M. Ass.*, 1915, lxxv, 1003.

In his own work, since 1896, Hartzell has noted a seeming relationship between mouth sepsis and chronic rheumatism, because of the coincidence of cure in the latter following the extraction of abscessed teeth or the cure of a pyorrhea. Systematic research work, supported by animal inoculation, was carried out by first making careful röntgenographic examination of the teeth and jaws. Whenever dental abscesses were present, the abscessed teeth were isolated with dry gauze, cleansing the tooth or root with iodine, and whenever possible, cauterizing the tissue about the neck of the tooth, then extracting the tooth, and biting off the root tips with sterile forceps, which tissues have been immediately dropped into culture mediums. These plantings have invariably produced, among other organisms, the streptococcus viridans

which has been the organism used in the author's animal inoculation in the intensive study of a certain number of these cases.

Though the author has carried on intensive study and animal inoculation from material obtained from a comparatively few of the patients presented in this series, he has invariably found the streptococcus viridans present in the confined dental abscess, and, in order to satisfy himself as to its common presence in the tissues about the teeth, he has made cultures up to the present time from 220 patients and has invariably found this organism to be present not only in the confined dental abscess but in the superficial tissues of the peridental membrane about the teeth. He has found this so constantly that he was impressed with the idea that it must always be present. He, therefore, has attempted to obtain teeth which were free from streptococcus viridans, and to that end has extracted a number of living teeth containing healthy pulps. The roots of these living teeth with healthy pulps have usually also afforded growths of streptococcus viridans when planted in the manner just described unless he cauterized the gingival crevice. Following this technique, he has been able to find, out of a total of 50 vital teeth examined, 10 teeth containing living pulps, the roots of which have proved to be germ-free when planted in broth. He believes that the dental path is commonly infested with streptococcus viridans, not only the superficial tissues immediately surrounding the teeth but all dental abscesses.

Hartzell considers that arthritis of dental-path origin is characterized by slow onset with exacerbations and remissions, which exacerbations seem coincident with the filling to distention of dental abscesses or retention of pus from deep pyorrhea pockets, and which drain directly into the circulation. The amount of material absorbed may be great, as a pyorrhea case with one-quarter inch average depth of pocket has 7.5 inches of ulcerating surface from which to absorb pus, which in the end firmly seats disease in the tissues of the individual. He has constantly noted exacerbation of joint inflammation following surgical treatment of pyorrhea or the curettage of alveolar abscesses, and exacerbation is particularly likely to occur as tension of continued abscess fluid increases.

Treatment of pyorrhea pockets consists in curettage and evacuation of dental abscesses which confers a double benefit. Such surgical interference necessarily inoculates the patient with a large number of organisms, inducing an effect similar to that of an efficient vaccine, with the added advantage that the constant supply is shut off from the focus disturbed. When many pyorrhea pockets or abscesses exist, it is important to permit from three to six days to intervene between treatments in order to gain the full advantage of what might be called surgical auto-inoculation. Certain it is that the above method brings about a constant and permanent gain generally ending in cure, where-

as if sudden complete extirpation of all foci is practiced, as, for example, extraction of all the teeth at once, as is done in some instances, or extraction of all the teeth and removal of tonsils on the same day, the end-result will be positive harm.

CHARLES M. JACOBI.

Hammond, R.: The Role of the Nose, Throat, and Accessory Sinuses in the Etiology of Chronic Infectious Arthritis. *J. Am. M. Ass.*, 1913, LV, 1091.

The work upon which this article is based was undertaken to determine how far the assumption of a local focus of infection in cases of arthritis holds true.

The author states that while occasional brilliant results in chronic infectious arthritis are obtained by the removal of tonsils containing pus-pockets or by the drainage of a suppurating sinus, these are the exceptions rather than the rule. During the past two years most of the cases of chronic infectious arthritis which have come to the orthopedic clinics of the Rhode Island Hospital and St. Joseph's Hospital at Providence, in which the etiology was not readily determined, have been referred to the ear, nose, and throat departments of these hospitals for examination.

The results are tabulated as to the following points: (1) preponderance of tonsillar infection, 30 out of 61; (2) results after operation for infectious conditions of nose or throat, marked improvement in 2 out of 12, slow but gradual improvement in 3; (3) course in cases showing evidence of nose or throat infection but not operated upon, improvement in 7 out of 18. The results of operative treatment in these cases were on the whole not encouraging, marked improvement after operation resulting in only a few instances.

In most of these cases the damage seems to occur early in the course of the disease. The time for investigation and treatment of the focus is in the early stages. Patients who have had previous attacks and have recovered without permanent damage to the joints should have the focus removed, if it can be discovered, to prevent recurrence of attacks. Experience has shown that the greatest benefit in these cases is to be expected from stimulating measures tending to build up the general health of the patient, trusting to later improvement in the local joint conditions as the patient responds to treatment. F. J. GARRISON.

Sever, J. W.: Pneumococcal Arthritis: Report of Six Cases. *Boston M. & S. J.*, 1913, CLXXX, 382.

Pneumococcal arthritis is a condition which usually occurs during the course of pneumonia, and it is relatively infrequent. It generally appears during the first nine days, but may come on at a later period. Primary pneumococcal arthritis attacks are rare. Severe arthritis may follow a mild case of pneumonia.

Arthritis occurs in about 0.1 per cent of pneu-

monias. It may occur at any age, but it is apt to be more common in the first ten years of life. It is more common in the male than in the female. Primary joint infections are more common in children than in adults, and previous joint injury predisposes to the infection. Alcoholics are particularly prone to the infection.

The knee is most frequently involved, the shoulder next, the other joints as follows: elbow, hip, ankle, and wrist.

The process is usually suppurative, but in some cases may be serous.

There may be three forms: (1) light, without visible changes, (2) serous, (3) purulent. There may be periarticular conditions also, with secondary joint involvement. The mortality has been given from 30 per cent (in infants) to 75 per cent. In children the end-results are usually good as far as the joint is concerned.

Forms one and two may get well without other treatment than simple fixation; they may possibly require aspiration.

Where pus is present there is usually little permanent damage, provided the drainage is satisfactory and the infection has occurred after the pneumonia has cleared up. In certain cases the infection overwhelms the patient in spite of drainage. Ankylosis is rare.

Clinically the condition is similar to that of an acute inflammation.

Its connection with pneumonia makes the diagnosis more or less simple, but it should be confirmed by a bacteriological examination.

The treatment consists of aspiration for bacteriological examination and to determine the presence of pus. If this is present free drainage should be instituted. Curetting should be avoided. Fixation should be done after operation.

The author reports six cases of pneumococcal arthritis. These cases represent various methods of infection by the pneumococcus, namely:

1. From the mouth by way of tooth infection.
2. By trauma with previous known pneumonia.
3. By a previous pneumonia, followed by an otitis media.
4. By trauma, followed by pneumonia, and involvement of the joint in nine days.
5. Following several attacks of bronchopneumonia, and immediately after an acute attack of otitis media.
6. Involvement of joints two weeks after an acute attack of lobar pneumonia. This case represents the only typical one.

All these cases had the diagnosis confirmed bacteriologically except Case 4, which was included in this series on account of the improbability of its being anything else. The fluid in all these cases was rather thin and greenish-yellow when the joint was first opened, but as it continued to drain at the time of the operation the heavier pus escaped. It was during this period that the fibrin flakes were expressed. The mortality was three out of six

cases, or 50 per cent. The joints, so far as the author has been able to determine, are practically normal in the two cases he has been able to follow.

In several cases fibrin flakes were expressed from the joint at the time of operation. Of these the author says: "The extraction of the fibrin flakes was of interest and apparently is a condition to be expected in joints infected with the pneumococcus. The cocci apparently find lodgment in such flakes, and they should always be expressed by squeezing or by careful extraction if possible, so as not to break them up any more than possible."

ARCHER O'REILLY.

Zueblin, E.: *Chronic Arthritis Treated with Radio-active Mineral Water*. *Maryland M. J.*, 1915, LVIII, 242.

A report is given of two cases of advanced chronic arthritis which were given large doses of a faintly radio-active mineral water, with resulting very slight and temporary subjective relief of the pain and some of the swelling. In acute arthritic conditions the water seemed to increase all the symptoms.

The author concludes that only by constant and careful medical and dietetic supervision of these cases is a definite improvement possible.

C. H. RUCHOLZ.

Shere, O. M.: *Myositis Ossificans Traumatica*. *J. Am. M. Ass.*, 1915, LXV, 1012.

The author confines himself to discussing the morbid process wherein bony tissue finds lodgment within muscular structures, such process occurring after a single closed injury to the region thus involved. To this process the author gives the name myositis ossificans traumatica.

He has classified injuries into closed and open, and calls attention to the fact that in over 200 cases of traumatic myositis ossificans which he has collected from the literature, not a single one occurred after an open injury. He says that for certain pathologic reasons when connective tissue is traumatized, the proliferation of fibroblasts or osteoblasts, as the case may be, takes place; when the injury is a closed one the process of proliferation goes on and the new cells by their migration invade every available space in the surrounding and neighboring tissues until restrained by some new structure that they may encounter which acts as a limiting membrane. By applying this pathologic principle to the subject under discussion, we must needs conclude that, given a closed injury to the bone structure in a previously healthy individual sufficient to cause a proliferation of osteoblasts and these in turn encountering no resisting structure to check their distribution, a bony deposit may result in any of the neighboring tissues, be they muscle, tendon, or fascia; whereas in the case of an open injury involving the tissues named above the migration of these fibroblasts toward the site of injury is not impeded. By making fine fibrillary connections with the cells nearby, they ultimately

form the granulation tissue of healing wounds. To this must be added the well-known fact that the power of regeneration is ordinarily greater in connective-tissue cells than in any other form of cells in the body, and that this activity is greatly enhanced when stimulated by injury.

The author gives in detail one of his recent cases. He advises early operation on all such cases.

R. O. RITTER.

Stewart, M. J., and Flint, E. R.: Observations on the Myeloid Tumor of Tendon Sheaths. *Brit. J. Surg.*, 1915, III, 90.

After a careful review of the literature on non-osteous myeloid tumors, the authors have been able to collect 73 published cases, including 2 of their own. Of this number fully two-thirds have been recorded by French and German authors. The authors' cases here reported are of considerable clinical interest.

There was a definite history of local injury in each. Each occurred at the early age of 27 years after a long history of development, several years elapsing between the local trauma and the appearance of the tumor.

With regard to the diagnosis, stress is laid on the small size of the tumor, and on the very slow rate of growth. Pain is usually absent, and unless the growth attains a considerable size, function is but little interfered with. It is not adherent to the bone, and the skin may move freely over it or be slightly adherent. The diagnosis can only be made with certainty by means of the microscope, but a very probable clinical diagnosis can usually be arrived at beforehand.

The precise site of origin of these tumors is not always perfectly clear. The great majority undoubtedly arise from tendon sheaths, but a certain number apparently take origin from fascia, such as the palmar fascia.

On removal, the growth is characterized by its great density, its frequent lobulation, and peculiar greyish-yellow color on section.

As these tumors are to all intents and purposes benign growths, conservative treatment should be adopted. The tumor should be excised locally, it can be shelled out with considerable ease, and in event of recurrence, the authors advise that a second local operation be given a trial before anything radical is done.

ARTHUR J. DAVIDSON.

Mock, H. E.: Treatment of Hand Infections from an Economic Viewpoint. *Surg., Gynec. & Obst.*, 1915, XII, 481.

Statistics secured from a number of industrial and accident insurance companies show that from 5 to 20 per cent of the total accidental disability is due to hand infections. Prevention of hand infection is therefore a very important economic factor. The most valuable preventive measures are:

1. The use of tincture of iodine as a prophylactic measure.

2. Sending every injured employee to the doctor for immediate dressing.

3. A careful study of the etiology of these accidents and the systematic removal of the same from the workrooms.

4. Removal of all predisposing causes of infections found in the employees. Here the periodical medical examination of the working force is one of the greatest aids. Interesting in this connection is the frequency with which hand infections have been found in employees suffering from acute tonsillitis. The hemolytic streptococcus was isolated from the hand infections in a large series of cases.

By these preventive measures among 12,000 employees, hand infections were reduced 40 per cent within three years.

In active treatment of hand infections, a radical rather than a temporizing plan was adopted. In some 400 serious cases, 146 were given hospital treatment, while 256 were treated from the doctor's office as ambulatory cases. Of those treated at the hospital, 46 per cent were aborted without surgical interference, while only 17 per cent of the ambulatory cases escaped surgical interference. The average length of disability from the hospital cases was 7.4 days, as compared with 11.3 days for the ambulatory cases. Only 2 of the hospital cases have permanent disability, while 12 of the ambulatory cases are permanently disabled. By hospital treatment, a patient can be kept absolutely quiet, continuous hot dressings can be better applied, and better operations can be performed because of the facilities for giving a general gas anæsthetic. Also, by the early adoption of hospital treatment, dangerous infections can be prevented, with fewer permanent deformities, and disability greatly reduced.

Of the greatest economic value is the proper diagnosis of the location of the pus and the proper surgical interference for the drainage of the same; and above all, these hand infections must be treated as serious surgical conditions from their inception.

FRACTURES AND DISLOCATIONS

Huntington, T. W.: A Review of the Literature of Fractures. *Ann. Surg.*, Phila., 1915, LIII, 264.

The author has made a rather comprehensive study of the literature on fractures covering the last ten years. It is interesting to note the diversity of opinion and the growth in the use of the bone transplant and the decline in the tendency to use the Lane bone-plate. His conclusions are as follows:

1. The public demands and is entitled to better results from fracture treatment than have hitherto been obtained.

2. From 80 to 90 per cent of long bone fractures can be successfully treated by the closed method, but conservative treatment exacts a high degree of skill and close attention to details.

3. Resort to the open method is of too frequent occurrence.

4. The least possible amount of foreign fixation material should be the rule; steel plates in the treatment of fractures are a menace from the standpoint of permanency.

5. Bone transplant is the fixation material of choice, and intermedullary splints are inferior to the autogenous bone implant; fixation material of whatever type is not to be relied on for maintenance of alignment.

6. Care of non-union and faulty union which come to secondary operation indicate indifferent methods of primary treatment.

7. Operative treatment of compound fractures should be withheld until the external wound-healing is perfected. Many joint fractures can only be treated successfully by the open method.

8. Normal contour and good function are closely related in the end-results of all fractures.

J. W. SEVER.

Caldwell, C. E.: The Roentgenogram as an Aid in Fracture Work. *Intern. M. J.*, 1915, xiii, 1035.

The author calls attention to the great advance in the knowledge of fractures since the advent of the roentgen ray, and with this a better understanding as to treatment has developed. By actually viewing fractures the necessity for operation has been perhaps overestimated and a review of all the disasters resulting from ill-timed and injudicious interference would likely cause many to hesitate who now rush in.

The popular belief that a bad sprain is worse than a fracture has verification in the frequency of roentgenograms of fracture sprains. Nowhere has the X-ray been of more value than in showing fractures in and about joints, such as fractures of the tibial spines or linear splits of the tibia, femur, etc.

Several radiograms are shown in the original article illustrating the points discussed. The author believes after an extensive experience that fairly good function is entirely compatible with rather unfavorable X-ray findings and that the future will see a truer estimate of the necessity of operative surgical interference.

H. W. MEYERDING.

Allen, H. R.: Fractures; New Ideas and New Instruments. *J. Am. M. Ass.*, 1915, lxx, 1240.

The author condemns the leaving of foreign bodies permanently embedded in the tissues for the fixation of fractures.

He has developed a new technique in the treatment of fractures, apparently especially applicable to the forearm, arm, and leg. He uses long metal pins passing through and through a limb, transfixing the bone fragments in different planes, the projecting ends being firmly united by a metal bar of low melting point, 160° F., readily permitting the necessary soldering by means of hot water.

After union has occurred the pins are easily removed without secondary surgical operation. Short incisions are frequently employed to secure absolutely accurate apposition.

These pins provide excellent outside control over inside conditions, should later adjustment be necessary. No infections have occurred up to the present time.

The method is comparatively free from pain. The author's armamentarium, which is shown by excellent illustrations and minutely described, is extremely ingenious. Several forms of bone-grafts are described: an intramedullary, so-called telescopic bone-graft and another double opposed wedge-graft which automatically locks itself and the fractured bone together. A novel method of constructing fracture splints from steel wire and adhesive is described. The author considered the method far superior to plaster of Paris.

F. J. GAESSEN.

Skilern, P. G., Jr.: Fractures of the Sesamoid Bones of the Thumb. *Ann. Surg.*, Phila., 1915, lxi, 297.

The author reports a case of fracture of the ulnar sesamoid of the thumb and quotes from the literature on the subject and also cites some experiments performed in attempts to cause a similar fracture.

The case cited was a man, 26 years old, who fell so that the left thumb was traumatized against a stone pavement. Physical examination three days later showed a moderate swelling of the left thumb, ecchymosis along the thenar eminence, and "wincing" tenderness at the base of the first metacarpal. An X-ray showed a fracture of the ulnar sesamoid bone opposite the head of the first metacarpal, the smaller fragment being separated distally, there being a definite dentate line of fracture. There was also an oblique fracture at the base of the metacarpal, separating the ulnar corner and entering the joint at its middle. Further clinical examination showed the patient was very loose jointed and there was "wincing" tenderness localized to the ulnar sesamoid bone. Treatment consisted of four weeks' immobility and then massage.

The author reports and illustrates with pictures the results of experiments in which he tried to produce the fracture both by direct and indirect violence. His conclusions lead him to believe that indirect violence is the most effective method of producing the fracture. The author says, however, that the three cases previously reported by other authors were reported as due to direct violence.

LLOYD T. BROWN.

Johns, S. M.: Congenital Fracture of the Clavicle, with Other Faulty Bony Conformations. *J. Lancet*, 1915, xxiv, 530.

The author reports four cases of congenital fracture of the clavicle, with other bony manifestations of a congenital pathological condition, in the same family. Absence of traumatic history and a history of congenital rachitis with negative blood tests, and in each case some other manifestations of rachitis, were the reasons for the diagnosis of congenital rachitis. It is believed that dietetic and

medicinal measures would probably fail at such an advanced stage of the disease. Surgical intervention was recommended for the cases where the fracture had failed to unite by either fibrous or bony union.

C. H. BURNETT.

Davison, C.: Autoplastic Repair of Fractures of Neck of the Femur. *Ann. Surg.*, Phila., 1915, lxx, 284.

Davison reports that failures resulting from autoplastic repair of fractures of the neck of the femur are due to errors in technique in the operation and after-treatment, and that more experience is necessary to perfect a new surgical procedure.

In the selection of the transplant he advises that a section of the fibula of the same extremity be used in either recent or ununited fracture of the femoral neck. The peg of bone is denuded of its periosteum, and the canal in the femur is made to fit the peg, not the peg to the canal, thus the fibular peg retains its strength.

In applying the transplant to the fracture the fibular peg is made to pass from the outer side of the femur upward and inward, the point resting just above the depression for the insertion of the ligamentum testes.

After the application of the transplant the thigh is placed in a position of abduction, external rotation and slight flexion, the leg being slightly flexed on the thigh.

Immobilization is accomplished by applying a plaster of Paris cast, which is applied from the axilla to the toes on the affected side; on the opposite side only to the knee. This is done to prevent any motion of the spine or unaffected hip which would prevent immobilization.

Eight to ten weeks' time is necessary for immobilization, and weight-bearing should not be attempted for some time afterward.

In the aged, autoplastic work for fracture of the neck of the femur should not be attempted on account of the effects of anesthesia and prolonged immobilization.

J. H. SHAW.

Rasmussen, C. M.: Operative Treatment of Closed Fractures of the Patella. *South. M. J.*, 1915, viii, 874.

The author discusses principles in the method of treatment of a fracture of the patella, describes his method of operation and reports seven cases.

He believes that the synovial membrane under the patella is usually torn, and that the fibrous fascial membrane which covers the upper surface of the patella suffers the same fate and that blood and small bits of chipped bone may enter the joint and bring on traumatic synovitis, or that force used in bringing parts into position may also do damage to the joint.

The resulting synovitis should be treated, whether open or closed methods are used, by gentle pressure bandages, fixation, light massage, and Paquin cautery.

He does not believe that an open operation should always be advised. He carefully describes the operation and the after-treatment of seven cases, which resulted in perfect cures. X-ray plates of all cases are shown.

C. C. CHRISTIAN.

Motley, J. G.: First-Aid Treatment of Fractures. *Old Dominion J.*, 1915, xxi, 97.

Motley, after mentioning the predisposing causes and symptoms of fracture, takes up the treatment in general of fractures from the point of view of first-aid care. In his article he emphasizes the importance of making a thorough examination of the patient as to his general condition as well as to the local injury so that shock may be prevented and any condition which may influence the future treatment discovered. He combats pain with morphine, and protects the fracture with improvised splints.

In compound fractures Motley advises against cleaning the wound until the patient has been placed in the hospital and prefers to paint the wound with a 3.5 per cent tincture of iodine and apply a moist dressing of 2 per cent carbolic acid. Hemorrhage is best controlled by packing, but if a tourniquet must be applied, it should be placed at a good distance proximal to the wound.

In gunshot fractures inflicted at close range tetanus is common, and antitetanus serum should be given as soon as possible. Bullets should not be probed for.

In fractures of the base of the skull, the author strongly advises the use of urotropine and spinal puncture. In administering the urotropine, 15 to 20 gr. should be given by mouth and, if unable to swallow, 30 gr. by rectum. At least 120 gr. should be given the first two days. Where symptoms of intracranial pressure are present lumbar puncture should be done sufficiently often to relieve. It may be necessary to do two punctures a day; sometimes one puncture will suffice, sometimes six or more are necessary. From 30 to 60 ccm. should be withdrawn at each puncture.

F. D. DICKSON.

Loth: Fixation Methods in the Treatment of Fractures and Pseudarthrosis (*Erhebungen ueber die Fixationsmethoden der Knochenbrueche und Pseudarthrosen*). *Beitr. z. Klin. Chir.*, 1914, xvi, 131.

Loth gives a critical review of the newer methods of operative treatment and a report on 225 cases.

1. Simple bloody reposition of fragments was done in 25 cases. There were good results and perfect function in all cases, with little or no shortening. The indication of this method is given in simple transverse fractures not reducible by manipulation.

2. Silver wire suture was used in 91 cases, mostly fractures of the olecranon and patella, some cases of fracture of clavicle. Good results are reported in 76 cases, pseudarthrosis in 6 cases.

3. Nailing of the fragments was performed in 20 cases, mostly fractures of the neck of the femur.

The results were: 14 cures, non-union or fibrous union in 6 cases.

4. Bruns' clamps were used in 6 cases of fracture of the tibia. Good results are reported, but at the same time the author admits the disadvantage of the loosening of the clamps and the subsequent sinus formation.

5. Bolting with ivory pegs was used in 16 cases. The results were less satisfactory. The technical difficulties with this method are great.

6. The best results were obtained from plating. It was used in 97 cases with 88 good results and only 3 instances of pseudarthrosis. The author considers the last method to be the method of choice.

A. STEINDLER.

Foster, G. S.: A Steel Pin Open Method of Treating Fractures. *Am. J. Surg.*, 1915, xxix, 321.

The author presents, in particular, three cases of fractured bones treated by fixation of the fragments by means of a steel pin. The pin is driven through the fragments, after complete exposure of the part, and under aseptic surroundings, and retained there for three weeks. An accompanying fixation splint is used for a longer period of time.

JAMES R. MARTIN.

Estes, W. L.: End-Results of Bone Fractures. *Ann. Surg.*, Phila., 1915, lxii, 278.

Estes, in presenting the report of the committee of the American Surgical Association on the results of bone fractures, states that 1,745 cases were collected, of which 1,358 were non-operative and 387 operative.

The operative cases were considered as (1) immediate, and (2) delayed. The immediate operation was performed within ten days after accident, the delayed operation took place after ten days.

Under fifteen years results were better and the conservative treatment generally used. The best functional result and the shortest period of disability were after a good anatomical restitution had been accomplished. Under fifteen years the open method was only occasionally performed, but the results were as good as the non-operative.

In compound fracture the non-operative and the operative treatment were about the same for anatomical results, but the operative treatment produced better functional results, except in compound fracture of both bones of the leg where poor function resulted. Age had no effect on the result of treatment except in senile cases.

The period of disability in simple fractures ranged from 9 to 14 weeks in fractures of the humerus; for fractures of both bones of forearm about 10 weeks; fracture of femur about 7 months; and fracture of leg 4.5 months; leg 6 months; and fracture of the upper extremity 4 months.

The humerus should not show more than 1 cm. of shortening, and no angulation. The forearm should show no shortening, and pronation and sup-

ination should not be hindered. The femur should show not more than 2 cm. of shortening, and no angulation, nor in fracture of the bones of the leg should there be any shortening or angulation.

There is no special splint or particular method of treatment used. The best results follow after wise selection and skillful application of apparatus.

Traction methods are often used unskillfully; the object should be to have sufficient weight and countertraction to overcome shortening. After reduction of a fracture, a plaster cast may be used as a retentive splint.

Points recommended by the committee were that the X-ray should be used before and after the permanent dressings are applied, and also after removal of dressings.

Fractures should be reduced immediately after injury and anaesthesia used unless contra-indicated.

If operation is necessary for the retention of the fragments, it should be done within one week following the injury. The best methods are some form of plate or the Albee "inlay." J. H. SHAW.

Oehlecker, F.: Volar Dislocation of the Semilunar Bone with Fracture Sprain of the Os Triquetrum (Ueber die volare Luxation des Os lunatum mit Abbruch vom Os triquetrum). *Beitr. z. klin. Chir.*, 1915, xciv, 148.

The following is the mechanism of the isolated dislocation of the semilunar bone: (1) a heavy trauma, (2) extreme dorsal flexion, and (3) ulnar abduction.

Many cases reported in this group are not really volar dislocations of the semilunar, but dorsal dislocation of the carpus over the semilunar bone. For these cases the author recommends the name "perilunar dislocation of the hand." He reports four cases of true volar dislocation of the semilunar bone. When this condition is suspected a diagnostic point can be gained by bringing the fingers slowly into the position of overextension. Then the pressure upon the flexor tendon elicits a distinct pain, corresponding exactly to the location of the semilunar bone. This dislocation is often accompanied by a fracture of the os triquetrum. Among the conditions which may later follow the trauma are mentioned the post-traumatic ostitis semilunaris of Preisler and the traumatic osteomalacia of Kienboeck. The former condition was observed by Preisler after dislocations of the hand or after severe injuries of the ligamentous apparatus of the hand resulting in severe circulatory disturbances. Kienboeck's osteomalacia is likewise caused by circulatory changes following ruptures of the ligaments or compression fractures, in analogy with Kuemmel's post-traumatic spondylitis.

In regard to the treatment, the extirpation of the semilunar bone is advised, from a volar incision. The functional result of the operation is good.

A. STEINDLER.

Hoffman, C. S.: Dislocations of the Hip-Joint. *W. Virg. M. J.*, 1913, 3, 124.

Hoffman gives "misdirected energy and undue haste" as "his additions" to the impediments to reduction.

He reports two cases, the second having been reduced with the patient on his face by a method which he learned later was that of Stimson's of New York. Hoffman modifies the Stimson method by having only the injured leg hang over the side of the table instead of hanging both legs over the end. With the patient supported on the table, the thigh and leg are flexed, then weight put upon the calf and the leg extended. Three cases after failure from other procedures responded to this method.

Hoffman also mentions briefly two cases of simultaneous dislocation of both hips, a condition which he considers very rare, as he has been able to find reports of only a few cases. H. WINSETT ORR.

SURGERY OF THE BONES, JOINTS, ETC.

Henderson, M. S.: Operative Treatment of Bunions by the Mayo Method. *J. Am. M. Ass.*, 1916, LV, 1335.

The actual technique of the operation may be briefly stated. A semilunar incision with the curve upward is made at the metatarsal phalangeal joint of the great toe. The skin is dissected back, care being taken not to puncture it. A flap including the bursa is then taken with its base attached to the proximal phalanx, having its convexity extending on to the head of the first metatarsal. The fat is then pushed back from around the head of the bone and a large bone-biter is introduced from without inward, the aim being to take off most of the articulating surface of the head of the metatarsal bone, leaving sufficient of the enlarged end to serve as a weight-bearing portion. This bone-biter is introduced at an angle of about 75° so that the outer side of the metatarsal bone is a little longer than the inner side after the piece is removed. With a rongeur bone-biter the prominence left on the inner side is smoothed down. The flap is then tucked in and the base of the flap sewed to the periosteum of the first metatarsal by two mattress sutures of chromic catgut. This serves to straighten the toe and put it in its proper line. The skin is then closed with one or two sutures of silkworm gut and closer approximation is secured by interrupted horsehair sutures. A pad of gauze is inserted between the great and second toes to straighten the great toe. A dressing soaked with alcohol is applied and carefully bandaged.

The operation has been performed in the Mayo clinic on 148 cases, nearly all of them double, with on the whole most gratifying results. The keynote to success may be said to be: Leave enough of the expanded head area of the first metatarsal to permit of weight-bearing. If the entire head with its expansion be removed, the foot is weakened.

McKinley, W. R.: Conservation of Tissue and Function in Amputations. *J. Fla. M. Ass.*, 1913, 6, 58.

McKinley urges the economical importance of conservative surgery and rightly states that the trend of modern surgery is along the lines of conservation of tissue, anatomically and physiologically. If one thoroughly understands the nerve and blood supply of an extremity and appreciates the fact that so long as a part has a sufficient blood supply it will live and then many parts may be saved which otherwise would be sacrificed. A knowledge of the anastomoses between blood-vessels, which are particularly large and most numerous in the limbs, is of great importance in this respect, as amputation may be avoided or at least much less of an extremity removed if the surgeon feels sure that an adequate blood supply is present or will be established.

Second only to blood supply in importance in conservative surgery, the author places physiological rest by splints or plaster, with good drainage. F. D. DUKES.

Ashhurst, A. P. C.: Arthroplasty of the Elbow. *Ann. Surg.*, Phila., 1915, LV, 302.

The author reports the technique of an arthroplasty on the elbow-joint. Twice he has done this operation for bony ankylosis and three times for marked limitation of motion following fracture.

In the operation the ends of the bones are exposed by an incision along the external supracondylar line. The external condyle is detached from the humerus with an osteotome, the section entering the joint on the capitellar surface. The ends of the bones are shaped with a Gigli saw, usually only the humerus being so shaped. A flap of subcutaneous fat is taken from the back of the arm and put between the bone ends. The external condyle is replaced by means of a Lambotte self-boring screw. The elbow is put up in hyperflexion.

The first case is reported three and one-half years after operation. The boy was five years old at the time of the operation. The diagnosis was malunion of fracture of the external condyle; there was limited motion and cubitus varus. The limitation of motion before operation was 50 to 145° and cubitus varus 200°. Three and one-half years later the boy had full flexion, no varus deformity, and extension of 150°.

In the second case, a boy, aged 18, there was malunion of a fracture of the lower end of the humerus, limited motion, 40 to 110°, and cubitus varus. Operation was performed and eleven months later there was no cubitus varus, the elbow was stable, and motion was from 40 to 170°.

The third case, a girl aged 23, was troubled with bony ankylosis from metastatic arthritis. The ankylosis was of 10 months' duration with the elbow at an angle of 110°. Eighteen months after the operation there was motion in the elbow from 41 to 150°, the joint was quite stable, and there was active power of extension in the triceps.

The fourth case, a boy aged 14, had malunion of a fracture of the lower end of the humerus with limited motion, 65° to 150°. Five months after operation motion was 10 to 180° in full extension and the radius and ulna luxated backward. There was free lateral motion in the elbow, though the external condyle was firmly attached to the humerus. There was very slight power of extension in the elbow, but good power in flexion. Seven months after operation the elbow showed considerable improvement in stability.

The fifth case was bony ankylosis of the elbow from septic arthritis. Examination showed ulna humeral ankylosis at an angle of 110°. Rotation in the forearm was about one-half normal, supination being lost. Three months after operation there was free and easy motion from 90 to 120°. Rotation was normal, and the patient refused to have forceful motion under an anesthetic. LLOYD T. BROWN.

Gallie, W. E.: Tendon Fixation in Infantile Paralysis. *Ann. Surg., Phila.*, 1915, lxi, 481.

In this paper the author reports further the results of his original operation for correction of foot deformities by utilizing tendons of paralyzed muscles as anchoring ligaments. He admits that a similar principle was employed by Tilanus, Sangiori, and Reimer, but the technique differs. A preliminary report made two years ago gives the technique in detail, but the main principle may be stated briefly as an anchoring of the paralyzed tendon into a groove made in bone in such a manner that it acts as a ligament preventing the part from returning to the original deformed position. The lapse of three years has shown that the tendon does not stretch, that it unites solidly to the bone, and that the intervening length grows proportionately to the growth of the bone and other parts.

In applying the operation to correct a varus position of a foot an incision is made over the lower end of the fibula and the peroneal tendons exposed. A groove is made on the anterior margin of the fibula, the periosteum deflected, the peroneus longus laid in the groove and, while being held taut and with the foot in corrected position, sutured there with strong kangaroo tendon. The peroneus brevis is anchored on the posterior margin of the fibula, the purpose of the two different grooves for the two tendons being to procure a better balance and avoid the equinus position which results from placing both in a groove on the posterior surface. The foot is held in position by a cast for two months, after which the patient walks without splints of any kind. For calcaneus deformity the Achilles tendon is fastened in a groove on the posterior side of the tibia, and in case there is also a valgus from paralysis of the tibialis posticus the tendon of that muscle is anchored near its own groove in the tibia.

Cases sometimes present themselves with only partial paralysis of a muscle but with deformity, and in such, it being unwise to fix the entire tendon, it is split, one half is anchored and the other allowed to

remain free to serve the normal function. Six cases so treated have shown excellent results and the muscle partially paralyzed seems to regain power more rapidly because overstretching is precluded. In one case the opportunity occurred to obtain a fibula a year after fixating a tendon into it, and sections made through it showed a very intimate union between bone and tendon.

In one hundred of the author's cases there have been but two failures. One of these was due to planting the tendon with sheath intact, resulting, as was found by subsequent operation, in a synovial lining which prevented union. Since this case all tendons have been scarified before burying. The other failure was due to allowing the foot to change position after the suturing. W. A. CLARK.

Steindler, A.: The Paralytic Ankle-Joint; Review of Operative Methods. *Med. Herald*, 1915, xxxiv, 372.

Steindler considers the various operative procedures devised for the paralytic ankle-joint. From the standpoint of efficiency he contends that stability is the first requirement and should have preference before mobility.

The procedures considered for increasing the stability are: Whitman's operation; the erosion of the joint surfaces of the astragalus and tibia; arthrodesis for paralytic valgus deformity; the insertion of silk ligaments; Gallie's operation; the fixation of the ankle-joint by nails or ivory pegs; and the osteoplastic method as advocated by Cramer, who used a bone transplant from the anterior aspect of the tibia, fixing it in front of the ankle-joint.

Operations which are to restore power are: tendon transference, nerve palsy, and the direct neurotization of paralyzed muscles by direct implantation and muscle-to-muscle attachment. R. B. COFIELD.

ORTHOPEDICS IN GENERAL

Willard, D.: Association of Static Disturbances in Childhood. *Am. J. Orth. Surg.*, 1915, xiii, 241.

Static disturbances of childhood, i.e., some deviation from the normal of their supporting structures, fall into two main groups, those due to some bony or muscular defect and those caused by unequal weight distribution. These defects are seen especially in poor children who have not had the proper care or food to prepare their supporting structures for their work of weight-bearing. Many of these children begin life with, or acquire when first beginning to walk, some abnormality of their bony or muscular supporting column. Then either the defect may so increase as to cripple the patient or it may in itself remain insignificant but lead to a series of secondary deformities which gradually increase and which eventually materially impair physical efficiency.

The author has gone over 111 histories of children under fifteen years of age who had some static

abnormality of the lower extremities and divided them into three groups: those from one to five years, those from six to ten years, and those from eleven to fifteen years. In the first group 70 per cent showed deformity in both the upper and lower half of the supporting column. All cases in the second group showing foot or leg deformity showed also some spinal deviation. In group three 87.8 per cent showed leg and spinal abnormalities.

It is not claimed that these foot and leg conditions are responsible for all spinal deformities but it is claimed that a child with these foot and leg conditions has an inherent tendency to abnormal spinal curves. Treatment is purely a problem in mechanics. If the condition is recognized early the treatment is short and easy, but it is long, difficult, and unsatisfactory if secondary bone deformities have occurred.

R. O. RITTER.

Bendixen, P. A.: Flat-Foot. *Med. Herald*, 1915, XXXIV, 468.

The author discusses the various phases of flat-foot but offers nothing exceptionally new to those

familiar with the subject. He contends that the number of people suffering with static foot troubles is rapidly increasing, so that, outside of acute coryza, rheumatism, and gastric disturbances, they constitute the most frequent ailment of the inhabitants of the cities of the United States. This enormous increase is due to the demands of modern fashions which today call for high-heeled, narrow, and pointed shoes and pumps, together with excessively tight stockings.

The remote or underlying causes of static flat-foot are classified as congenital, neurogenic, inflammatory, traumatic, and constitutional. The direct cause, whether influenced by any of the above-mentioned contributory causes or not, is the alteration in the static conditions of weight-bearing, posture, or gait, or a change in the balance of the body from such conditions as knock knee, bad shoes, etc.

The treatment is palliative and curative. Strapping the feet and ankles with adhesive plaster, the fitting of proper braces and suitable modification of shoes are all considered.

R. B. CORFIELD.

SURGERY OF THE SPINAL COLUMN AND CORD

Turner, H.: So-called Ankylosation of the Spine; Bechterew's and Struempell-Marie's Disease (Ueber die sogen. Versteifung der Wirbelsäule und uober die Bechterew'sche und Struempell-Marie'sche Krankheit. *Ztschr. f. orthop. Chir.*, 1914, XXXIV, 428).

An extensive critical review is given of the entire literature on spondylitis deformans together with a short description of an anatomic specimen of this kind. There prevails in the literature considerable confusion, not only in attempting to establish the identity of Bechterew's and Marie's type of spondylitis deformans, but also in regard to numerous subdivisions and borderline cases. Most of the discrepancy between the statements of the different authors is due to lack of reliable pathological information and the inability of the observers to provide a sound anatomical basis for their theories. Among other points the dura mater and the medullary substance as well as the nature of the root symptoms are still under discussion and no definite conclusions have been arrived at.

A. STEINDLER.

Rugh, J. T.: Report of a Case of Typhoid Spine with Autopsy Findings. *Am. J. Orth. Surg.*, 1915, VII, 289.

The author shows that true infection of the spine takes place, but the typhoid bacillus is demonstrated with difficulty.

The resultant inflammation usually eventuates in ossification and necrosis, terminating in limited function. The spine shows less pathology than other joints, probably due to the vascular arrangement.

The case cited had a severe primary infection, complicated by a fall during her delirium. Metastases occurred in the lumbar spine, and a kyphosis quickly resulted but improved with hyperextension. The microscopical findings of three secretions were negative, but an abscess about one hip showed the typhoid bacillus many months after its involvement. The autopsy findings showed the absence of intervertebral disks at the site of involvement of the spine and a replacement by fibrous tissue limiting function. Pain was severe during the progress of the second involvement.

H. W. MALTBY.

Rockwell, O. H.: Report of a Case of Spina Bifida. *Penn. M. J.*, 1915, XVIII, 925.

The case cited was born with a double pelvis, three lower extremities, spina bifida, and an anterior anal outlet. The child lived for almost ten years, when a rupture of the tumor caused death.

JAMES R. MARTIN.

Fitzsimmons, H. J.: Four Cases of Unilateral Rotary Displacement of the Cervical Spine. *Internat. M. J.*, 1915, XXX, 983.

Fitzsimmons presents a well written and rather exhaustive anatomical and clinical study of what he calls "unilateral rotary displacement of the cervical spine." He lists the items of the symptom-complex as follows:

1. Inability to rotate the head without tilting the chin on the side affected.
2. Prominence of the transverse process of the axis on the side affected.

3. The presence of occipital pain to any degree.
4. The absence of muscle contractions which could explain the deformity and restriction of rotation.
5. Absence of nerve lesions.
6. Radiographic confirmation of cervical displacement.

The earlier article by Mixer and Osgood men-

tions all of these except the effect of rotation. Of previous writers, Fitzsimmons mentions Walton only and says that the manipulative procedure suggested by Walton has given successful results in his four cases. A further extended discussion of the anatomical details involved in a consideration of the condition concludes the article. H. WINSSETT ORR.

SURGERY OF THE NERVOUS SYSTEM

Mehler, L.: Neurolysis of the Plexus Brachialis (*Neurolyse des Plexus brachialis*). *Deutsche Zeitschr. f. Chir.*, 1915, cxxxiii, 299.

A case of Erb's paralysis of the plexus following gunshot injury is reported. The bullet entered the body at the inner upper scapular angle on the right side. An incision was made on the lateral border of the sternocleidomastoid muscle downward to the clavicle. When the plexus was dissected it was found adherent to the surrounding tissue both above and below the clavicle. It was freed carefully from its adhesions and sutured. The operation was followed by noticeable improvement. A. STEINDLER.

Gratzl, F.: Gunshot Injuries of Peripheral Nerves (*Schussverletzungen peripherer Nerven*). *Beitr. z. Klin. Chir.*, 1915, xxvii, 291.

Gratzl reports his work in a base hospital in Munich. He discusses the distinction between primary and secondary injuries of nerves, the difficulty in determining whether the nerve is completely severed or not, and the theories in reference to degenerative and regenerative changes after the severing of nerves. He then gives the case histories of 9 cases of nerve-suture and 6 of neurolysis. When it was necessary to resect the nerve, the cut ends could not as a rule be sutured together directly, but a plastic operation had to be done first; one or both of the ends was divided in half longitudinally and the cut sections reversed so as to form a bridge.

As a general rule the sutured nerves were sheathed in fat, and when possible their position changed so that they did not lie in scar tissue. The time since the operations has been from ten weeks to ten months. Thus far there has been marked improvement in galvanic and faradic excitability peripherally from the injury in 11 cases; there were no results in 3 cases; i.e., improvement in 73 per cent.

As an argument against Stoffel's claim that the individual nerve-bundles must be placed in exact apposition, Gratzl cites cases in which excellent results were obtained by a plastic operation on the nerves.

A. Goss.

Ingebrigtsen, R.: A Contribution to the Biology of Peripheral Nerves in Transplantation. *J. Exp. Med.*, 1915, xxvii, 418.

While the large amount of experimental and clinical work in transplantation which has been

done during the last few years has elucidated many essential points, and the transplantation of bone, skin, connective tissue, blood-vessels, and glandular organs has assumed a practical value, this, the author believes, has not been the case in peripheral nerve transplantation, because nerve transplantation in human beings has been mainly heteroplastic.

He first reviews the experimental work that has been done in this field and then records the results of his own experiments. He experimented on the sciatic nerve of rabbits from which pieces 2 to 3 cm. long were taken out and then either re-implanted into the same animal, united to the cut ends of the nerve by means of a single silk suture (autoplastic), or implanted into the sciatic nerve of another rabbit (homoplastic), or into guinea pigs (heteroplastic). He carried on three series of experiments, and in each series he operated upon several animals and the transplanted pieces were removed for histological examination at different intervals (4, 8, 12, 16, or 20 days) after the transplantation.

The author found that in autoplastic transplanted nerves a degenerative process occurred which resembled the ordinary Wallerian degeneration, but appeared a little more slowly than the latter. The cells of Schwann were in a condition of survival and were capable of multiplication after the transplantation.

In homoplastic transplanted nerves he found a degenerative process resembling a Wallerian degeneration, somewhat delayed. The cells of Schwann multiplied, and for some time at least were in a condition of survival. After twelve to fourteen days an abundant and increasing immigration of lymphocytes was observed, and from the eighteenth day the cells of Schwann developed a necrobiotic appearance.

In heteroplastic transplanted nerves numerous myelin ovoids were formed during the first four to five days, but there was no proliferation of the cells of Schwann, and no Wallerian degeneration was seen. The graft became necrotic within about two weeks.

The formation of ovoids that occurred during the first four to five days after the performance of the heteroplastic transplantation, the author states, did not reveal the condition of the life of the graft. This formation of myelin ovoids was found in the nerve-fibers when they had been kept in an incubator for 24 hours in Ringer's solution (Nageotte)

or in homologous or heterologous serum, but it was not found in the fibers after their incubation in isotonic salt solution (Nagostte), the presence of calcium being necessary for the occurrence of ovoid formation.

From this experimental study the author draws the following conclusions:

Heteroplastic transplanted nerves become necrotic. They are unsuitable for bridges in cases of nerve defects, and his results explain the failure of the attempts at heteroplastic transplantation of nerves in human beings.

If it is desired to bridge a nerve defect by implantation, autoplasmic or homoplastic grafts must be used. The occurrence of a Wallerian degeneration in these grafts during the first two to three weeks after the transplantation should make bridging a promising operation; for in this period the grafts resemble the peripheral part of a divided nerve and

must be assumed to be capable of regeneration and thus are very different from dead material.

The author has studied the process of regeneration and in a future article will communicate his results of bridging defects, which are encouraging so far as the function is concerned.

His results with homoplastic transplantation of nerves will, he believes, have a bearing on the homoplastic transplantation of limbs, which has been successfully performed in dogs by Carrel. None of his dogs lived long enough to show any function of the transplanted leg. The practical value of this operation is dependent, of course, upon the return of function, and especially on the regeneration of the nerves in the transplanted leg. The results with homoplastic transplantation of nerves seem to indicate the possibility of a regeneration of the nerves in a homoplastic transplanted leg.

GEORGE E. BEURY

DISEASES AND SURGERY OF THE SKIN, FASCIA, APPENDAGES

Dearborn, F. M.: Modern Views on the Treatment of Skin and Mucous Membrane Cancer. *J. Am. Med. Assoc.*, 1915, VII, 375.

Many cases of epithelioma can be successfully treated surgically, but the author prefers a combination of minor surgery (superficial curettement) followed by caustic or other local methods because it is less severe, more readily used, causes less scarring, and presents a much smaller percentage of recurrences. This refers solely to cases which do not show lymphatic involvement. Surgical interference is necessary in any type of epithelioma which even suggests lymphatic complications, for growths on the trunk with plenty of soft tissue about, and for most of the lip cancers. The advantage of the routine use of the X-ray or radium in combination with surgery has been constantly apparent.

The numerous pre-epitheliomatous lesions keratotic for the most part, are easily destroyed by carbon dioxide snow or by high-frequency sparking

after removal of the crusts, scales, or warty tops. The two agents just mentioned are the best adjuncts we have because alone or in combination with X-ray or radium they are constantly useful.

After the treatment of nearly 1,400 epitheliomata, the author can safely say that massive doses of radium in sufficient quantity and of a radio-activity not less than 300,000, preferably more, will cure or greatly improve more than half of the skin tumors which do not positively demand surgery; in fact, it will often benefit the group known as inoperable and also some post-operative cases. Only recently splendid results have been seen from its use in a most violent serpygious type which had partially yielded to other methods scattered over a period of four years.

While it is not wise nor prudent to use X-ray for all cases of epithelioma of the skin, the author believes that X-ray would cure or vastly improve 90 per cent of all skin cancers. EDWARD L. CORRELL.

MISCELLANEOUS

CLINICAL ENTITIES — TUMORS, ULCERS, ABSCESSSES, ETC.

Tennant, C. E., and Hegner, C. F.: A Paradox in Cancer. *Tr. West. Surg. Ass., Dec. Meeting, 1915, Dec.*

The case presents an interesting sequence of etiological factors with associated carcinoma of the mammary gland. Paradoxically it presents an equally important sequence of etiological factors with which carcinoma at the pylorus is usually associated, but without the carcinoma being demonstrable.

Notwithstanding the long and continued presence of carcinoma extending over a period of ten years, and two operations for recurrence; notwithstanding the possibility of metastasis and a constitutional predisposition to carcinoma; and notwithstanding the coexistence of a very chronic ulcer at a site most favorable to the development of carcinoma, and that too during the cancer decades of life, carcinoma did not develop.

The case was that of a widow aged 58. Since the age of 16 years she had been having attacks of stomach trouble with nausea and vomiting. These had been severe and almost constant since 1901.

When 23 years of age while nursing her infant the nipple of the left breast became sore, and an abscess developed, which was lanced through the nipple.

In 1900, twenty-one years after the abscess, the same nipple became sore again. This continued until 1907 when the trouble was diagnosed as Paget's disease and treated with X-ray without improvement. In March, 1910, there was a superficial pigmented and fibrosed ulceration. The nipple and areolar area were then excised.

In December, 1911, twenty-one months after the nipple excision, she returned with a mass in the upper inner quadrant of the same breast. This was the size of a hen's egg and adherent both to the skin and deeper structures. A complete operation was done, removing the breast, muscle, axillary, and supraclavicular lymph glands. Sections of this tissue were examined and reported as scirrhous carcinoma with glandular involvement. Four years after this operation the patient was free from recurrence.

In April, 1915, she presented herself for stomach trouble which had existed since she was 16 years old. Pain and distress were almost constant, vomiting was frequent, and the patient lost ten pounds in weight.

At operation the pyloric end of the stomach, the pylorus, and the first part of the duodenum were found to be fused into a firm mass firmly adherent to the surrounding structures. The stomach (pyloric end) and the first portion of the duodenum were resected. The mass was excised in wide limits and a posterior gastro-enterostomy was performed.

The history and the appearance of the tissues strongly indicated carcinoma, and at the time its presence was considered certain. Sections examined proved this last lesion to be chronic duodenal ulcer with encroachment on the pyloric end of the stomach. Slides were exhibited showing the epidermal carcinoma, Paget's disease, and the adenocarcinoma in the same breast, and the chronic ulcer of the duodenum and its gastric encroachment — but without evidence of malignancy.

Beitler, F. V.: A Discussion of the Cancer Mortality. *J. Am. M. Ass.*, 1915, lxx, 1324.

The author gives a statistical study of cancer mortality during the years 1903 to 1913, the figures being obtained from the Division of Vital Statistics of the Census Bureau. Several very interesting charts and tables are used.

In 1913 the deaths from cancer numbered 76,694. In 1904 there was a mortality of 70.15 per 100,000, and in 1913 a mortality of 78.88 per 100,000. Again, in 1904 cancer deaths represented 4.24 per cent of the total deaths, while in 1913 they represented 5.60 per cent. In contrast, the death-rate of tuberculosis, pneumonia, typhoid, and diphtheria showed a marked decline in the same period of years.

Sex distribution. Cancer is more frequent in females, but the pendulum of cancer mortality is slowly swinging from the female into the male popu-

lation. During the ten years, there was an increase of 39.75 per cent in the male population against an increase of only 27.38 per cent in the female. In 1903, 37.9 per cent of all cancer deaths were males, while 62.04 per cent were females; in 1913, 40.15 per cent occurred in males, to only 59.85 per cent in females.

Age distribution. The statistics were obtained from the census taken in 1900 and 1910. In 1900, 10 per cent of the total cancer mortality occurred prior to the fortieth year while in 1910, only 9 per cent occurred before that age. In 1900, between the ages of 40 to 50, there were 90.88 cancer deaths per 100,000, and in 1910, 101.36 deaths. In 1900, between the ages of 50 and 60, there were 108.43 deaths, and in 1910, 229.42 per 100,000. Between 70 and 80, in 1900, there were 495.84 deaths, in 1910, 661.54 deaths. Between 70 and 90 this increase was most marked, for in 1900 there were 587.44 deaths, and in 1910, 811.87 per 100,000.

Site of cancer. Cancer of the stomach and liver stands first with a mortality of 31.2 per 100,000. Cancer of the female genital organs stands second with 12.2 per 100,000, followed by cancer of the intestines with 10.5, and cancer of the breast with 7.3. All forms of cancer showed an increase from 1904 to 1913, with cancer of the intestines in the lead, 45.83 per cent increase, and cancer of the mouth second, 40.9 per cent increase. Cancer of the skin has shown little, if any, increase in that time.

Little difference of increase is shown between the two main varieties from a diagnostic standpoint; i.e., external cancers and those of internal organs.

All cases considered are those in which cancer is the primary cause of death and none of the borderline cases are included.

As a possible cause of increased mortality a change of sex distribution is considered, but it was found that in 1900, 50.03 per cent of the population were males and 49.97 females, and in 1910, 51.4 per cent were males and 48.6 per cent females. Likewise an increase of population prior or after the fortieth year was noted, but it was found that in 1900 the percentage of population under 40 was 72.80, and in 1910, 72.58; that the percentage in 1900 over 40 was 27.2, and in 1910, 27.42.

Beitler concludes that, based on the mortality statistics of the country, cancer shows a decided increase.

P. M. CHASE.

Byford, H. T.: The Etiology and Prophylaxis of Carcinoma. *Tr. West. Surg. Ass.*, Des Moines, 1915, Dec.

A review of some of the known facts about carcinoma led the author to the following conclusions:

1. Carcinoma is an infection. In no other way can the known facts be accounted for.
2. Carcinoma is in the great preponderance of cases introduced into the system with the food.
3. The human faces are carriers of the germs of carcinoma, both in individuals affected and in

many who are not. Such contamination of the faeces can be made to explain how chimney sweeps suffering with chronic irritation of the scrotum become infected. It can also be made to account for the infection of the female genitalia with carcinoma. Infected faeces are liable to contaminate the soil in neighbourhoods where the provisions for sewage and drainage are defective.

4. Individuals most subject to carcinoma are those who work most in the dirt, and who eat a great variety of food from doubtful sources, increasing the chances of infection.

5. The infection is probably spread by the increase of railroad traffic and the crowding of people in industrial centers. The increase of cancer in recent times is, to a great extent, in the alimentary canal, and probably has some relation to the increase of ulcer of the stomach, gallstones, mucous colitis, appendicitis, and chronic intestinal diseases. These in turn have become more frequent as a result of the increasing complexity and richness of diet during the past century. Pastries, candies, cakes, sweetmeats, fancy bakery goods, etc., are now within the reach of all but the very poorest, who do not have carcinoma as often as those in good circumstances.

6. The author thinks that the pancreatic secretions, particularly trypsin, inhibit the development of the germ and prevent the duodenal ulcer from becoming infected with carcinoma, and asks the question whether it or some similarly acting vegetable ferment or artificial ferment could not be used for the destruction of the disease or the production of immunity.

7. Dr. Maud Slye has shown that immunity and increased susceptibility to cancer may be inherited in mice, and that in mice some animals exposed always develop cancer when the conditions favorable for its development are present, while others never do. This would explain why gastric ulcers become carcinomatous in some patients and not in others. A healthy alimentary canal is one of the greatest safeguards against carcinoma, excepting of course a natural immunity.

The foregoing conclusions have suggested the following recommendations:

1. Carcinoma should be considered an infectious disease.

2. Precautions against the spread of the infection should be taken by the community as well as by the individuals affected.

3. Foods, particularly fruits and vegetables, should be protected from contamination at their source and in transit. All fruits and vegetables from general sources should be sterilized before being eaten, except such as have a complete covering or hard external surface that can, after a thorough cleansing, be removed. The use of human excrement as a fertilizer should be prohibited by law.

4. The disposal of human excrement in suburban and populous rural and manufacturing districts should be such as to avoid possible contamination of the surface soil. The faeces of patients with car-

cinoma of the alimentary canal and pelvic organs should receive the same attention as those of patients with typhoid or cholera.

5. Women should be taught the infectious nature of normal stools with particular reference to keeping the perineum free from contamination. They should also be taught to spend a considerable portion of their time washing their hands.

6. The number of cats and dogs in populous districts should be restricted, and they should not be allowed to roam about the streets by day or night. The raccoons should be killed. Means should be taken for the extermination of rats, mice, cockroaches, and other vermin. This should have been done long ago as a protection against the spread of other infections.

7. Individuals whose occupations are known to expose them to great risk of infection from carcinoma should be taught that it may get into their systems either through the irritated skin or by way of the alimentary canal. They should be taught to keep the skin free from chronic lesions and should wash their hands very thoroughly before eating; and also to wash and disinfect their hands very thoroughly and change their working garments when they leave their work for the day. All workers in dirt should observe these rules.

8. That all epithelial areas affected with chronic irritation and erosion should be attended to, has already been emphasized by others. An attempt might also be made to prevent infection of ulcerated and eroded surfaces in the alimentary canal. Patients with such lesions should of course avoid all unsterilized food that might be contaminated. Whether it would be useful to give a large dose of trypsin or something with a similar catabolic or germicidal action once or twice daily in cases of ulcer of the stomach, or a pint or more of a solution of acetozone or alphasone, or some other non-poisonous substance that might be found to have a destructive action upon carcinomatous cells and parasites, is a question that the author thinks deserves consideration.

9. Municipal authorities should put carcinoma upon the list of diseases to be reported, in order that the patients may be traced and taught how to take care of themselves and their infected discharges, and that none of those living with them be allowed to handle foodstuffs for the market.

10. The blood of patients with carcinoma should be exhaustively studied with reference to the discovery of something that will increase immunity, for until we learn more about the germ, the establishment of immunity would seem to afford the best hope of preventing infections and recurrences.

11. The time would seem to be ripe for touching the public something concerning the erroneous notions about diet that are prevalent among the idle rich and prosperous poor in order that they stop manufacturing the serious forms of gastrointestinal disease that have of late years shown such an alarming increase in frequency, the seeds of

which are sown in adolescence and the fruits of which are harvested at maturity and in senescence. In this way the danger of infection by contamination might be greatly diminished.

12. Women who have not borne children for several years should be warned of the danger of developing carcinoma, and should not only be on the lookout for symptoms but should submit to a pelvic examination at least twice a year until it is evident that the mucous membranes are healthy and are remaining so.

Černic, M.: Gas Phlegmons (Gasphlegmonen). *Wien. klin. Wchnschr.*, 1915, xxviii, 1934.

The author gives a table showing his treatment and results in 15 cases of gas phlegmon, and concludes that all gas phlegmons should be treated operatively. In those cases without gangrene or fracture the treatment may consist of free incisions; when the phlegmon has involved the muscles the diseased parts should be radically excised. In cases of fracture without gangrene, if the patient's condition is good and he refuses amputation, an attempt should be made to save the limb, but a very careful watch should be kept of it, so that amputation may be performed promptly if necessary. If it is delayed too long the results will be fatal.

In cases with gangrene the only treatment that offers any hope at all is prompt amputation. If projectiles are lodged in a limb affected with gas phlegmon they should be removed at once. Sometimes after apparent recovery the process flares up again. In such cases incision and excision of diseased tissues should be repeated until healthy tissue is reached. All wounds should be covered with gauze wet with hydrogen peroxide, and these wet compresses should be renewed frequently until the wound is clean and shows healthy granulations.

A. Goss.

Selter, H.: Etiology of Gas Phlegmon (Zur Ätiologie der Gasphlegmone). *Deutsche med. Wchnschr.*, 1915, xli, 1189.

Selter examined 14 cases of gas phlegmon microscopically and by the culture method. He concludes from his examination that gas phlegmon is not always caused by Fränkel's bacillus, but may be caused by various kinds of anaërobic bacteria. In only 4 of his cases did he find bacteria that corresponded entirely to Fränkel's description of his bacillus. There were abundant spores in the other cases, and Fränkel's bacillus only occasionally give rise to spore formation. The bacteria in the other cases behaved considerably like those of symptomatic anthrax. The specimens were sent to Leipzig and 2 of the spore-bearing strains injected into guinea pigs without any results, while 2 of the non-spore-bearing ones, evidently Fränkel's bacillus, were injected, with the usual fatal consequences.

If the disease is not, as would appear from this

study, uniform in its etiology nothing is to be gained by treating it with a serum or vaccine prepared from Fränkel's bacillus. It is more important to cleanse the wounds quickly and thoroughly. In 14 cases of shrapnel injury that came into the author's hands soon after wounded he cleansed the wounds thoroughly, and on examining the wound secretion he found abundant anaërobic, gram-positive bacilli, some of them spore-bearing. But as a result of the thorough cleansing gas phlegmon did not develop in any of the cases.

A. Goss.

Dubs, J.: Antitoxin Prophylaxis in Traumatic Tetanus (Zur Serumprophylaxis bei Tetanus traumaticus). *Kor. Bl. f. Schweiz. Aerzte*, 1915, xlv, 609.

A boy of 17 received an open wound on his forearm and was given a dose of 25 I. E. tetanus antitoxin one hour, and another 12 hours, after the injury. The arm had to be amputated two and one-half days later for gas phlegmon, the bacteriological examination of which showed Fränkel's bacillus. There was slow and complete recovery, except that the axillary glands remained swollen for two weeks. The patient was completely well five weeks later, when tetanus suddenly set in, and in spite of the injection of 60 I. E. antitoxin he died. In this case we see severe tetanus developing in spite of two early preventive injections of antitoxin and in spite of the early removal of the local focus of infection by amputation. Dubs assumes that the enlarged lymph-glands played a part in the etiology, as did also the presence of the bacteria of gas phlegmon.

Dubs believes that prophylactic injections of antitoxin should be given at short intervals, 7 to 12 days, for five weeks and that the doses should be larger than those ordinarily used. Antitoxin prevention cannot be adjudged a failure till these demands have been strictly fulfilled. In the local treatment the lymph-glands of the region should always be taken into consideration.

A. Goss.

Burnham, A. C.: The Administration of Glucose Solutions as a Prophylactic Against Post-Operative Shock. *Am. J. M. Sc.*, 1915, cl, 431.

The author bases his views on a series of experiments that has proved that sugar, in the form of glucose, supplies energy to cells and aids in tissue repair; it diminishes acidosis and thus tends to remove the chief factor in post-operative vomiting; it neutralizes certain poisons in the circulation, and probably is a direct cardiac stimulant and food.

Accordingly it is recommended that to patients in whom no contra-indication to oral feeding exists, a meal of bread and cereal be given 8 to 12 hours prior to operation; further, a feeding containing 100 to 200 calories is given 3 hours before operation; e.g., 6 oz. of coffee or orangeade containing 1 oz. of lactose.

If for any reason food cannot be given by mouth, Kausch recommends the intravenous administration

of a 5 per cent. freshly prepared and sterilized glucose solution, or a 4 to 5 per cent solution may be given as a hypodermoclysis; 2 to 3 liters can be injected in the course of 24 hours. The simplest way is to use a 5 per cent solution of glucose in tap water by the Murphy drip method instead of the now generally used post-operative saline proctoclysis.

The following conclusions are reached: (1) Glucose solution should be given as a routine measure after every operation in which there is reason to fear more than the ordinary amount of post-anesthetic shock. (2) It should be given as a routine measure in every case where post-operative oral feeding may be difficult or insufficient for a considerable period after operation. (3) It should be given as an emergency measure either before or after operation for the relief of an existing or threatened acidosis.

LISTER TUHUSKE.

SERA, VACCINES, AND FERMENTS

Brufenbrenner, J., Schlesinger, M. J., and Mitchell, W. T.: A Modification of the Abderhalden Test. *J. Am. M. Ass.*, 1915, lxx, 1268.

The authors review the theory upon which the Abderhalden test is built, and cite the fact that Abderhalden and his supporters still maintain that errors obtained with the test are due to faulty technique. However, he points out that a constantly growing number of men have not been able to confirm his work or sanction it in part only. They believe that the poor results obtained by many men with the test are due to a faulty understanding of the relations of the ingredients to each other rather than that the test is too difficult to be properly performed.

As against Abderhalden's views as to the theory of the test they support the contention that the substrate present in the Abderhalden test is not digested. It acts as an absorbent for the antitrypsin, thus settling free the trypsin (present in every serum), which thereupon digests the serum proteins of the serum tested.

They believe the test to be specific in this degree. If used in exactly the right amount the antibody in the specific serum unites with the substrate antigen, forming the first phase of the reaction. Then the "sensitized substrate" absorbs the antitrypsin and permits digestion of the serum proteins, forming the second phase of the reaction.

Their modification of the test consists essentially in this. After remaining over night in the see box, in contact with the suspected serum, the placenta (or other substrate) is centrifuged, washed free of serum, and incubated with any serum-containing complement. The authors suggest using male guinea-pig serum.

They conclude that the Abderhalden test depends on the presence in the serum of specific substrates which are not of a fermentive nature.

The substratum is not digested during the test.

Dialyzable split products originate from the serum as a result of its autodigestion, and not from the substratum.

Analysis of the test shows that it consists of two phases, and this gives a basis for a useful modification of the method.

F. H. FAIR.

BLOOD

McArthur, L. L.: Thrombo-Angiitis Obliterans (Intermittent Claudication). *Tr. West. Surg. Ass., Des Moines*, 1915, Dec.

There exists in the relatively young of neither diabetic, syphilitic nor angioneurotic type, a spontaneous gangrene termed "thrombo-angiitis" by Buerger, and "spontaneous gangrene of the young" by Koga, a common occurrence among his countrymen and limited in this country almost entirely to the Jewish race.

Mayesima determined the constant high viscosity of the blood in all cases of gangrene. Acting on this Koga confirmed Mayesima's findings and reduced the viscosity by diluting the blood with physiologic solutions. Cases which in the past were invariably condemned to high amputation he succeeded in curing by the simple expedient of hypodermoclysis of sufficient quantity and extending over a sufficient period of time to reduce the viscosity of the patient's blood. The testimony of all those who have faithfully carried out Koga's recommendation verify his claim.

Simons, L.: Experiences with the Sodium Citrate Method of Indirect Transfusion of Blood (Lewisohn). *J. Am. M. Ass.*, 1915, lxx, 1338.

The author reports his results in three cases with the sodium citrate method of indirect blood transfusion. In two of these cases both the direct and the indirect methods were used.

The disadvantages of the direct method of Crile and Carrel are: (1) numerous technical difficulties; (2) the length of time spent; and (3) the impossibility of accurately estimating the amount of blood used.

On the other hand, with the citrate method the technique is the simplest, the blood may be accurately measured, and remains fluid indefinitely. However, it exposes the blood to the air, adds a foreign substance and brings the blood into contact with foreign materials.

In Case 1, following the transfusion of 200 ccm. of blood by the citrate method, the patient became profoundly shocked but recovered in a short time and voided claret-colored urine. Later, a second transfusion by the direct method raised the hemoglobin from 25 to 55 per cent without shock or bloody urine. One hour later the patient underwent an exploratory laparotomy in good shape but died the next day.

In Case 2, following the transfusion of 200 ccm. by the citrate method only moderate shock was observed, with no bloody urine. The hemoglobin

rose from 38 to 48 per cent and the patient underwent a supravaginal hysterectomy in excellent shape.

In Case 3, a ruptured ectopic pregnancy, the direct method of transfusion was used, with no evidences of shock or bloody urine. The hæmoglobin rose from 43 to 51 per cent. One week later, following a transfusion of 300 ccm. by the citrate method, the patient went into profound shock and died shortly afterward.

Simons concludes that at the present time the citrate method is dangerous and should not be used. He believes the direct method of Crile much the safer and less likely to produce shock.

P. M. CHASE.

BLOOD AND LYMPH VESSELS

Beer, E.: Ligation of the Portal Vein in Suppurative Portal Phlebitis. *Am. J. M. Sc.*, 1915, cl, 348.

Beer reports a fatal case of suppurative portal phlebitis which he operated on in an effort to save. He cites the conclusions of Geister, Neuhoef, and Brewer relative to the feasibility of ligating the portal vein. Geister believes the operation to be logical but to be attended by technical difficulties and problematic results. Neuhoef states that ligation of the portal vein regularly leads to death in a very short time—in half an hour to two hours. He has, however, demonstrated that gradual occlusion of the vein is not fatal. Brewer and Burkenko indicate that occlusion due to pressure followed by ligation is not incompatible with life. Guided by the above Beer attempted the following plan:

1. To insure an adequate collateral circulation he attempted a lateral anastomosis between the left spermatic and one of the large branches of the inferior mesenteric vein. In this he expected to have an assured anastomosis between the portal and systemic circulations.

2. Omentoplexy. At a second operation he planned to perform an omentoplexy ligating the portal vein and draining the gall-bladder. The patient died two days after the second operation. The entire plan was not carried out owing to conditions met with.

ISIDORE COHEN.

SURGICAL THERAPEUTICS

Eastman, J. R.: The Old Art and the New Science of Surgery. *Tr. West. Surg. Ass.*, Des Moines, 1915, Dec.

Art is the application of means and methods to accomplish desired ends. Science is the systematized knowledge of principles and laws. Surgical art is old. Surgical science is new. Formerly surgical knowledge was purely empirical. It was art, not science. Scientific surgery, according to the modern concept, that is, "formulated knowledge of surgical principles and surgical laws, based on biologic facts," may be said to have come into existence dur-

ing the last century with the birth of the school of physiologic medicine founded by Broussais, Bichat, Roser of Stuttgart, and Wunderlich, who called pathology "the physiology of the sick," and the advent of cellular pathology, with the associated new development of the ancillary surgical sciences, as physiology and bacteriology. Thus, the pure sciences of cellular pathology and bacteriology of Virchow and Pasteur established and explained causes, principles, and laws, which, joined with the older applied science or art of surgery with its knowledge of phenomena and facts and supported by all the rapidly evolving tributary sciences having to do with the origin, structure, development and function of living things brought forth the newer group science or compound science of surgery.

We think of Morgagni, Magendie, Bernard, Recklinghausen, Rokitsansky, Lister, and Johannus Mueller, and others of their type and generation as the founders of the modern research science of surgery. Concerning the great surgical architects and artists as well as the philosophers of this important period, it is to be said that however much we may admire their ingenuity in invention, or their virtuosity in technical performances, or their fine skill in spinning theories, we cannot catalogue them among the fathers of present-day surgical science along with Virchow and Pasteur and their sympathetic contemporaries. Thus, Lawson Tait, renowned in the annals of surgical art, cannot, if we recall his polemic to Saenger declaring bacteria to be the products of disease, be grouped with Langenbeck and Billroth, surgical scientists who were "as expert with the microscope as with the knife and equally great with both."

The modern composite science of surgery has evolved chiefly in all the laboratories of its separate component and ancillary sciences where surgical art was and is, alas, too often a stranger.

Recently the most valuable contributions to surgery have come from the laboratories of biology. We need no priestess upon a tripod to tell us that surgery of the future will look more and more for strength and inspiration to the vigorous sciences of biochemistry and physiology though it must continue to rest upon its original footing of normal and morbid anatomy, nor that the way to the most complete surgical development for any individual will lie not only through the "blood and sawdust" but also through the "glass and brass."

Surgical art and surgical research science rarely reach their highest development in one individual and the practical and desirable alternative has been and will be to associate the genius of surgical research in one individual with the gift of surgical art in another in an harmonious working union. The ideal arrangement of the future will be that which includes the establishment of special laboratories of surgical research in close association with the theatres of surgical art, and which includes the close association of both with large facilities for the study of the broader aspects of disease.

positive in 54 per cent of the malignant cases. It is also positive in a number of other conditions. It is positive in fever, but disappears soon after the fever declines. It is also positive in the later months of pregnancy, in uncompensated heart-disease, in cirrhosis of the liver and icterus gravis, in some advanced cases of pulmonary tuberculosis, in some of severe diabetes mellitus, of chronic rheumatic polyarthritides, and of severe chronic nephritis and uraemia. But it will be noted that none of these are conditions that are apt to be confused with malignancy, with the possible exception of icterus. This gives a positive reaction whether it is due to cholelithiasis or cancer, but in the former condition it disappears with the cholemia, while in cancer it persists.

The reaction is negative in all the diseases that are apt to be confused with cancer, such as benign tumors, ulcer of the stomach, chronic gastritis, enteritis, and chronic colitis, surgical tuberculosis (if non-febrile), chronic inflammations of the female genitalia, and syphilis. Thus, though the melostagnin reaction is not really specific it will certainly contribute to a differential diagnosis in many cases where the usual clinical methods do not. It becomes manifest very early in the development of a malignant tumor, as has been shown, not only by positive results in early cases where the tumor was the size of a cherry to that of a walnut, but by animal experiments performed by Ishiware. He inoculated rats with malignant tumors, and got a positive reaction twenty days after the implantation.

A. Goss.

MILITARY SURGERY

Bürger, L.: Fat Embolism in Military Surgery (*Die Bedeutung der Fettembolie für den Kriegschirurgen*). *Med. Klin., Berl.*, 1915, 11, 996.

Bürger thinks that too little attention has been paid to fat embolism in surgery. It is frequently the cause of death when it has not been recognized at all. Fat emboli may cause emphysema, pneumonic foci, heart weakness, arteriosclerosis, and nervous diseases, and may, moreover, afford a point of least resistance for the development of bacteria. Fat embolism may occur either in the lungs or in the organs of the greater circulation. Its diagnosis is quite difficult and in Bürger's cases was never made during life. The fact that it is so difficult of diagnosis makes it doubly important to bear it in mind and take all possible measures to prevent it in cases where it is apt to occur, especially in cases of multiple fracture or severe wounds, or in patients subjected to severe concussion by being run over by vehicles, thrown from horses, or hurled by explosions. In such cases immediate application of an Esmarch bandage will prevent further destruction of fat tissue by the blood and also prevent further transportation of that already broken up. Even Mummberg constriction at the waist line is justifiable in cases of crushing injury of the pelvis.

Animal experiments have shown that fat that has already become disintegrated is sometimes fixed by the coagulation of the blood and thus embolism is prevented. The constricting band should not be left on more than half an hour. It may be possible to drain away loose fat particles by venesection before the bandage is removed, but Bürger is not inclined to think this is necessary. Some authors advise injection of gelatine to hasten coagulation, but he thinks this may favor the development of thrombosis.

It is very important not to attempt to transport patients who are in danger of fat embolism. They should be left perfectly quiet. The crushed soft parts should be thoroughly drained. If it is necessary to amputate crushed limbs it should be done at once, as delay increases the danger of fat embolism. Delirium should be prevented or checked to avoid the violent motion it brings about. The harmful effect of chloroform is increased by fat embolism, so it should not be used as an anesthetic in such cases. The treatment of fat embolism is regarded by most surgeons as hopeless, but Bürger thinks life may often be saved by prompt diagnosis, opening up the injured bone and tamponing it. Venesection relieves the heart and is advisable for this purpose. Saline infusion has been advocated by Gaugele and others, but Bürger thinks it is contra-indicated, because it imposes more work on the right heart. He believes that stimulation of the heart is useful, and that the danger, feared by some, of driving the embolism from the lungs into the greater circulation, is slight. The onward passage of the embolism, he thinks, is due rather to the nature of the fat and the condition of the capillaries of the lungs.

Because of the danger of oedema of the lungs and venous stasis in the other organs it is useful to divert fluid to the intestines by means of calomel. If symptoms of pressure on the brain from venous stasis develop, leeches applied to the mastoid process may assist in diverting the fluid. Lumbar puncture is useful both in diagnosis and treatment, but care must be taken to remove the fluid slowly and to keep a constant watch on the pressure.

Recovery from fat embolism requires a much longer time than from the same injury without embolism. The patient is apt to complain for a long time of weakness, dizziness, rapid fatigue, heart disturbance, or depression. Some of these symptoms may be relieved by repeated lumbar puncture, supplemented by physical methods of treatment, such as hot air, sun-baths, and general hygienic care, especially the avoidance of either physical or mental overexertion.

A. Goss.

Bier, A.: War Aneurysms (*Über Kriegsaneurysmen*). *Zschr. f. Anal. Farbd.*, 1915, 11, 481.

Within the past two months Bier has performed 44 operations for aneurism on 43 patients. The time that had elapsed since the injury varied from eight days to three months. The walls of the sacs

and full pastille doses administered through this for two or three weekly sessions. By this time the fungation has generally disappeared. On the next irradiation the filter is increased to 1.5 mm. together with a few layers of lint between the filter and the patient, and full pastille dosage administered as before. The filter is then increased to the maximum thickness of 2 mm. and the sessions continued as long as necessary at less frequent intervals. The author claims that the site of the lesion is practically without scar after treatment.

HOLLIS E. POTTER.

Bruce, W. J.: An X-Ray Detector for the Removal of Foreign Bodies in the Tissues. *J. Roentg. Soc.*, 1915, xi, 120.

The author states that his apparatus is a method of assisting the surgeon to remove a foreign body, the previous localization having been made by any of the well-known methods. Marking the precise location of a foreign body on the skin is of little assistance to the surgeon, because at the first incision such marks disappear.

Bruce uses a combination of X-ray couch and operating table. The patient is fixed by straps attached on both sides. The X-ray tube arranged underneath the couch can be moved easily in any direction. Above the tube a screen is so fixed that the cross-wires which are underneath correspond exactly to the central radiation. By moving the tube-box about, the foreign body is brought directly under the cross-wires. The screen is then removed and there is substituted for it a sterilized guide, which is placed in the cross arm and pinned in position. To this is added a director previously sterilized, the director being in the position which corresponds exactly to the central radiation from the tube. If the line of the director be continued it must come against the foreign body. Thus a needle introduced into the tissues in this line will strike it. By marking the director the surgeon can know the depth at which he may expect to meet the foreign body. This apparatus has worked excellently in practice.

HOLLIS E. POTTER.

Shaxby, J. H.: Localization of Foreign Bodies by Means of X-Rays. *J. Roentg. Soc.*, 1915, xi, 113.

Owing to errors incident to the employment of the usual measures for the localization of foreign bodies, Shaxby employs a localization method of his own which he describes in detail. This method is one of perpendicular, as contrasted with parallel, displacement. Two skiagraphs are taken from distinctly different directions. In essence his method consists of a movement of the patient through a measured distance along a line perpendicular to the plane of the plate. In practice this would inevitably lead to some change of the patient's position, so the procedure actually followed is to displace both tube and plate by equal distances in the specified directions, thus keeping constant their

distance apart. Examples of the method with various modifications to suit different conditions are given.

HOLLIS E. POTTER.

Krönig, B.: Prevention of Injurious By-Effects in the Treatment of Deep-seated Carcinomata with Radium and Mesothorium (*Zur Verhütung von Nebenschädigungen bei der Behandlung tiefliegender und tiefgreifender Karzinome mit Radium und Mesothorium*). *Deutsche med. Wochenschr.*, 1915, xli, 1180.

From the author's experience with these two agents in the treatment of carcinoma he comes to the conclusion that the injurious by-effects are caused chiefly by overdosage. Some authors have thought that this could be overcome by using only small quantities of the radium or mesothorium, but this is not the case; more injury can be produced by a small amount if too long applied, than by a large amount if properly applied.

The late effects of radium and mesothorium appear after a much longer time than those of the röntgen rays, generally not till after 8 or 10 weeks, so there is more danger in having the treatments close together and thus getting a cumulative late effect.

Another way of avoiding injurious effects is to use auxiliary filters to exclude the secondary rays produced by the metal filters. The nature of the metal filter does not make so much difference. Brass does not have that superiority over lead, copper, nickel, or gold that its early advocates claimed for it. Others have claimed that the by-effects were due to the fact that radium and mesothorium do not have any elective effect on pathological tissue, and thus in order to destroy deep-seated carcinoma it was necessary to injure the overlying tissues. This is disproved by the fact that carcinoma nodules have frequently been destroyed by these agents without injuring the overlying skin, and tumors of the uterus and ovary have been successfully treated without injuring the intervening tissues. These agents have as great and possibly greater selective action than röntgen rays.

A series of cases is described, and the author states in conclusion that he has never had reason to regret having treated operable cases of carcinoma with radium and mesothorium instead of surgery. A comparison of the results with those of surgery, he claims, shows a balance in favor of radiotherapy.

A. Goss.

SURGICAL DIAGNOSIS

Wissing, O.: Meistagmin Reaction in Malignant Tumors (*Zur Meistagminreaktion bei bösartigen Geschwülsten*). *Berl. klin. Wochenschr.*, 1915, li, 998.

Wissing discusses the meistagmin reaction proposed by Ascoli and further developed by Izar, and gives a bibliography of the work done on the subject. He tested the reaction in 500 cases of malignant and non-malignant disease and found it

ELECTROLOGY

Russ, S.: Protective Devices for X-Ray Operators. *J. Roentg. Soc.*, 1913, 31, 110.

From his experimental investigations Russ shows that there is a wide difference in the thickness and quality of lead rubber material used in X-ray installations. He found that in 3 different sets of samples the X-ray energy transmitted through the sample varied from 0.1 to 5 per cent. This when used with a bulb was usually employed during seven examinations.

With samples of lead glass varying in thickness from 1.35 mm. to 1.5 mm. the X-ray energy transmitted varied from 1.0 per cent to 4.3 per cent. The energy transmitted, however, depended more upon the quality than upon the thickness of the glass. The density of the glass is the important factor, and the absorbing power increases more than proportionately to the increase in density.

In the subsequent discussion the importance of the danger to the operator from secondary radiation, including the secondary radiation given off by the screen, was mentioned. HOLLIS F. PORTER.

Tugman, O.: X-Ray Sensitometry. *J. Roentg. Soc.*, 1913, 31, 121.

The author reports on certain experimental investigations made in the Research Laboratory of the Eastman Kodak Co. to determine the sensitiveness of photographic plates to X-rays. He states that it has been shown that the penetration of an X-ray beam is dependent upon the length of the waves of which the ray is composed. The shorter the wave-length the greater is the penetrating power and the greater the potential necessary to produce it, so that the potential applied to an X-ray tube is roughly a measure of the hardness of the rays obtained, while the current through the tube corresponds to the intensity of the beam. Ordinarily, however, the radiation from a tube is a mixture of various wave-lengths, and in order to make exact measurements it is necessary to have rays of known wave-length measured in some standard manner. If such homogeneous beams of X-rays can be obtained, then X-ray sensitometry can be put on a basis comparable with sensitometry to monochromatic light.

Although such an investigation has not yet been carried out in the laboratory, the tests made show that the action of X-rays on emulsion films is similar to that obtained by the action of light, except that the X-rays act throughout the thickness of the film, but this difference is to some extent marked, especially in thick coatings, by the slow penetration of the developer.

The sensitiveness of photographic materials to X-rays, however, cannot be determined in the same way as to light, but must be considered as the density which can be obtained for a given exposure with development continued to the limit.

HOLLIS F. PORTER

Cole, I. G.: Technique and Experimental Application of Hard Rays for Deep Roentgentherapy. *Surf. Genes. & Obs.*, 1913, 100, 132.

The high non-fluctuating penetration which may be obtained with a Coolidge tube has rendered deep roentgen therapy much more satisfactory than with the ordinary type of tube.

Experiments show that it requires eleven minutes of exposure, using the entire capacity of seven different tubes of the old type, to obtain the same amount of deep radiation that can be obtained from a single Coolidge tube in less than one-half the time.

Filters of aluminum or leather, or both, and cross-fire make it possible to treat deep-seated areas without burning the skin. But the tube must be placed in a specially constructed box protecting the patient and operator.

The rays diminish as the squares of the distance from their source, but it is hard to realize that a tumor nine inches from the focal point would receive less than one-half the rays at the surface of the skin, six inches from the focal point, even if no solid tissue were interposed. A single pastille cut in two, and one-half exposed at six inches and the other at nine inches from the focal point, graphically demonstrated this fact.

An amount of unscreened ray necessary to change a pastille from 0 to 4 on the Hampson scale is considered an erythema dose. If, however, a ray of high penetration emanating from a tube backing up an eight- or nine-inch parallel gap is screened by three mm. of aluminum, 19 to 16 Hampson units may be administered, but care must be observed to prevent overlapping of areas treated. With the old type of tube, without the cross-fire or filter, even if 6 Hampson units were applied on the surface, only one-sixteenth of that would reach the tumor three inches beneath the surface. But it is possible by using 13 to 16 Hampson units of highly filtered rays through each of twenty ports of entry, and by repeating the procedure in three series to administer more than 150 times the amount of ray administered to the tumor three inches beneath the surface than could have been administered by the old tube without cross fire and filtration. This has been done repeatedly with some very satisfactory results, but as this paper was on technique, no case reports were given.

Kempster, C.: The X-Ray Treatment of Fungating Epithelioma with the Introduction of Progressive Filtration. *Lancet Lond.*, 1913, *clxxxix*, 867.

The author reports 3 cases of fungating epithelioma treated successfully by progressive filtration. The first treatment consists of a full pastille dose without any filter at a distance of 10.6 cm. from the anticathode, the healthy surrounding tissue being protected. This treatment is repeated at weekly intervals for two or three doses. In the next treatments a thin 1 mm. aluminium filter is introduced

were not formed by the walls of the artery, but by fascia, muscle, and clotted blood. They varied in size, the largest being the size of a child's head. The arterial aneurisms were larger than the arteriovenous ones and caused more severe symptoms. Most of the aneurisms were caused by rifle bullets, very few of them by shrapnel or grenades. In 14 of the cases the arteries were ligated above and below the aneurism and the injured piece of artery removed. This is not the operation of choice, but it was performed in these cases either because the arteries were so small that their ligation could not cause any serious interference with circulation; because a collateral circulation was already established; or because the wounds were severely infected and the arteries could not be safely sutured.

Bier does not extirpate the sac, as was formerly done, because he thinks this sacrifices too many collateral branches. He finds the hole in the artery and ligates immediately above and below it so as to spare all branches. The wall of the artery, as mentioned before, does not form the wall of the sac. In the other 30 cases the arteries were sutured. The circulation should always be cut off with a bandage or rubber tube before the operation is performed. Otherwise the profuse bleeding will interfere seriously with the necessary dissection of the artery. Some authors hold that it is difficult to find the artery if the circulation is cut off. In such cases the artery might be located first and the bandage applied during the dissection and suture of the artery.

In 15 of the cases a lateral suture of the artery was all that was necessary; in 12 the two ends were directly united by circular suture, and in 3 a piece of saphenous vein was inserted. Lateral suture should be performed when possible.

In one of Bier's cases he did a lateral suture when the artery was so severely injured that its lumen was reduced one half, but in spite of that the patient recovered without the slightest ill-effect. Where circular suture is necessary he first applies two button sutures on opposite sides of the vessel, placing intima in contact with intima. An assistant holds the threads attached to these sutures, and thus holds the vessel in such a position that intima lies in contact with intima. Then the operator runs a continuous suture from one of these points to the other, and then around the other side.

He has not had good effects with vein transplantation and thinks that it is indicated in very few cases. The arteries can be sutured together circularly when there are quite wide gaps in their continuity—as much as 6 cm. In cases where the gaps are longer than 6 cm. a collateral circulation is generally established, so that ligation can be performed safely. Operation on arteriovenous aneurisms is more difficult than on arterial ones. It demands extremely careful separation of the artery and vein. It is better to do the separation, particularly near the opening between the vessels, with a knife than with a blunt instrument, as less damage is done to the tissues.

Bier believes that vessel suture will be extended in the treatment of aneurisms to cover practically all cases, except the severely infected ones. It demands more skill on the part of the surgeon than other methods, but the results are correspondingly better. Among his 43 patients there were only 2 deaths, one from infection in the case of a severely infected wound, and the other from thrombosis of the innominate artery in a case where the carotid was ligated near its junction with the innominate. All the others have either recovered or are on the way to recovery.

A. Goss.

Carles, J. and Charrier, A.: *General Anæsthesia with Ethyl Chloride in Military Surgery* (*L'anesthésie générale au chlorure d'éthyle et la chirurgie de guerre*). *Prog. méd.*, 1915, xlii, 478.

The authors find that ethyl chloride anæsthesia is quite as valuable in operations of forty-five minutes' duration as in those of five minutes', though it has ordinarily been used heretofore only in very short operations. It is particularly valuable in military surgery because of the saving of time. It only takes from a few seconds to two minutes for the patient to become anæsthetized, and about the same time for him to awake from the anæsthetic. The toxic action is very slight; there is seldom vomiting and if any it is much milder than after chloroform or ether; albuminuria seldom follows, and if it does it is slight in degree. This makes it particularly valuable in cases of shock, feeble pulse, etc. They have used this form of anæsthesia in 200 of 700 cases operated upon during the past five months. In administering it several cubic centimeters should be given at first to obtain complete anæsthesia; after that about 0.5 ccm. every three or four minutes. The three or four respirations of pure air when the mask is raised to give the ethyl chloride are generally sufficient to prevent asphyxia. There is no danger of heart failure, as with chloroform, and in the rare cases where there is difficulty in respiration a few movements of artificial respiration generally restore the patient.

Though analgesia is perfect the relaxation of the muscle is not so complete as with ether or chloroform so that the latter anæsthetics are still to be preferred for long and delicate abdominal operations, but in others ethyl chloride could be substituted with advantage.

A. Goss.

Duncan, C. H.: *A Positive Method of Curing Purulent Infection; an Appeal to the Army Surgeon*. *Internat. M. J.*, 1915, xxii, 996.

By selected case reports illustrating the methods of application the author makes a plea for the more universal use of his method of "autotherapy." Any type of infected wound is suitable for the practice of the remedy. Cases apparently moribund have been cured and the exact method of use in such cases is described in detail.

The simplest way to administer autotherapy to an unconscious patient is to give one-half to one

teaspoonful of pus per oz. The methods the author prefers and recommends are as follows:

1. Mix 6 minims of pus with 1 ounce of boiled water, shake well, and give in three divided doses an hour apart.

2. Mix in a mortar and grind thoroughly 10 minims of pus and 1 ounce of sugar of milk, 20 gr. of the mixture are given per oz every 15 minutes for three doses, and repeated when indicated.

3. One-half dram of pus is mixed with 1 ounce of boiled water, thoroughly shaken, and filtered through a Berkefeld filter; 1 ccm. is injected subcutaneously.

4. If one-half dram of pus cannot be obtained, 10 minims of pus are mixed with 1 ounce of boiled water and allowed to stand for 24 hours. The mixture is then filtered through a Berkefeld filter and 20 minims are injected subcutaneously. The indication for repetitions of the dose is a cessation of improvement from the preceding dose. To obtain the best results close observation of the patient is essential.

The prevention of infection by autotherapy is so simple that the author marvels it has not been more generally used by the profession. It means simply making a solution of the blood and wound discharge as collected on the gauze dressing and administering it to the patient. The detail of the technique is given. A standard equipment for a military hospital and a method of handling the patients are described.

ELLS FISHER.

Morley, J.: Surgery on the Gallipoli Peninsula.
Brit. M. J., 1915, ii, 461.

The author describes the difficulties of handling the wounded with the Mediterranean Expeditionary Force on the Peninsula, as compared to the conditions which obtain in Flanders with good roads and abundant motor transport to the railroad. Although the army medical authorities discourage surgical enterprise in field ambulances, the speedy evacuation of the wounded has not always been practicable, so that the clearing station near Lancashire Landing has been a point for some very interesting operative work.

The lacerated wounds are not unlike those seen in industrial towns, such as Manchester, except that they are caused by different agencies, such as bombs, high explosive shells, and shrapnel. Treatment of the soiled tissues by antiseptic lotions cannot by its mere application insure healing without suppuration. It has been found therefore that nothing short of complete excision of the soiled and devitalized tissues can be relied on to secure healing by first intention. This local excision of soiled tissues is not recommended after the onset of suppuration. When no vital part is involved the operation can be made complete, and it should be done within two to four hours after the occurrence of the injury. If the operation is thus done under sound technique, the result will be uniformly

satisfactory. The usual good results, however, may be interfered with when some important vessel, nerve, or other organ in the wound prevents complete excision.

The conditions vary widely with the character and nature of the wounds so that a uniform technique cannot be laid down. Local infiltration with cocaine and adrenalin is preferred to general anesthesia. The surrounding skin is cleaned and dried with spirits, then painted with tincture of iodine. The wound is swabbed with the iodine, and a clean excision of contused tissues is made, due care being exercised to avoid contamination of the new wound surface with the parts excised. The wound is next swabbed out with hydrogen peroxide, closed as far as the local conditions permit, and drained. Such treatment eliminates danger of suppuration and the occurrence of tetanus and gas gangrene. The drain should be removed at the end of thirty-six to forty-eight hours. The importance of very early operation as a time-saving factor in convalescence is emphasized. Men have been restored to duty in ten days with their wounds soundly healed, who would have remained on the sick list from four to six weeks when treated by the old granulation method.

Amputations are performed as early as possible, as a rule through healthy uninjured tissues, to insure primary union. All cases in which amputations and major operations are performed are kept at the clearing station two to three days after operation to see if the healing of the wound is progressing favorably.

Patients in extreme shock are given a dose of morphine and a copious saline infusion in the axilla. As a rule, an hour after the saline infusion is the best time for operation. The majority of terrible injuries succumb to shock in spite of all precautions.

The extent of injury to the skull is variable. In some cases the entrance and exit orifices are unattended with splintering and fissuring of the skull. Close shots do much injury to bone and the semifluid brain matter. In cases showing clean penetration it is the rule not to trephine but merely to shave the scalp and sterilize the wounds of entrance and exit with iodine. The majority of such cases die.

Contrary to the rule in other parts of the body, shell and shrapnel wounds of the skull offer a better prognosis than rifle and machine gun wounds. Shell fragments and shrapnel balls are usually attended with low remaining velocity, they are prone to cause compound depressed fractures without laceration to the dura. In such cases early operation, complete excision of the contused edges of the scalp wound, removal of all depressed and soiled fragments of bone by trephining, and the use of the gouge forceps comprise the best treatment. The sequelae and complications of such cases are not obtainable at a clearing station.

Penetrating abdominal wounds are divided into:

(1) rifle or machine gun wounds with small wounds of entrance and exit, (2) penetrating shrapnel or shell wounds or rifle bullet wounds with wounds of entrance only, or with large wounds of exit.

1. In wounds of the first category the bullet has drilled through intervening viscera, inflicting openings the size of its own caliber. The redundant mucosa of the stomach or intestine, when these are empty or partially empty, plugs up the hole until plastic lymph adhesions complete the healing process. Given morphine and rest with nothing by mouth for the first twenty-four hours, the majority of these cases were found to make an uninterrupted recovery. The chief exceptions were cases in which death was caused by internal hæmorrhage. Cases occurring under group 1 should not be dealt with in the advanced dressing stations close to the trenches, but they should be carefully carried by hand on stretchers to the main dressing station where the best trained assistants may be found.

2. Shell and shrapnel wounds are attended with much laceration of hollow viscera, which is often terrible and beyond hope of healing by plastic adhesions. The prognosis is generally bad. Rents of the intestines caused by the smaller shrapnel balls offer some hope of recovery, but unless operated upon promptly these cases invariably end in peri-

tonitis. The prognosis is bad in these cases in proportion to the number of perforations rather than the amount of extravasation of faecal contents. The author claims that shrapnel and shell fragment injuries of the colon are the most fatal of all. This is not the case with bullet injuries from the military rifle.—Reviewer.] The unfavorable environment adds to the fatal outcome in many cases, but early operation affords the only chance of saving of life. A few thus treated have recovered who would otherwise have died. In nearly all of the fatal cases the nature of the injuries were disclosed at operation, so that the prognosis apart from surgical help was quite hopeless.

The class of rifle bullet wounds received at short range, with large wounds of exit, as well as long range wounds where the bullets are apt to tumble and make irregular impacts, may be placed in the same category as shell and shrapnel wounds. Such cases should be closely observed. If they show early signs of peritoneal irritation prompt operative interference should be undertaken. The unfavorable field environment makes more imperative the necessity of having trained surgeons to do this class of work, who are familiar with the technique of modern abdominal surgery.

LOUIS A. LA GARDE.

WOUND INFECTIONS AND THEIR TREATMENT¹

By A. E. WRIGHT

THE author, drawing upon personal researches and those of his fellow-workers in France, discusses the questions of wound infections and their treatment; i.e., nature of infection, conditions in the wound, the therapeutic agents employed, and the defensive operations of the organism.

RIFLE WOUNDS TRAVERSING ONLY SOFT PARTS

Under these circumstances, the track becomes plugged with a blood-clot; and later, when the patient is moved, oozing takes place. Here there is only light microbic implantation in the walls of the track. Owing to the hæmorrhage, these microbes, however, are enveloped in a clot, thus bringing to bear on them the full bactericidal power of the extravasated blood. Further, the oozing that takes place is not blood, but serum expelled by the *vis a tergo* of blood pouring into the upper reaches of the wound, which blood acts as a reinforcement in protective elements; i.e., red and white corpuscles. The outflowing serum also tends to wash out the microbes from the wound. An experiment is described in detail, demonstrating this same point. If, however, the microbes are not killed, the oozing soon changes to a purulent condition, the clot disintegrates and there is a surface infection all along the track.

RIFLE WOUNDS WITH COMMINUTED BONE

In this condition, the charge of microbes is sowed far and wide through tissues whose circula-

tion is so disorganized that a washing out of the microbes is impossible. Likewise, the outflow of lymph is arrested by the desiccation of the external wound surfaces, and the wound becomes lymph-bound, external after-infection being easily acquired.

SEVERE SHRAPNEL, SHELL, AND BOMB WOUNDS

In comparison to bullet wounds, there is proportionally more bruising, larger portions of infected materials being carried in, and a heavier microbial implantation.

In this condition, the disorganization and shutting off of blood supply results where the wound is allowed to desiccate in dry gangrene; a line of demarcation slowly forms, provided the infection fails to spread through the underlying tissues and the tetanus bacillus remains inactive. Following this, the gangrenous layer is exfoliated and there remains a surface infection.

If the wound is kept moist, however, moist gangrene supervenes, necrotic tissues are converted into sloughs, and there is a more profuse suppuration.

SLIGHTER WOUNDS OF SHRAPNEL AND SHELL

These are comparatively superficial wounds, with the bacteria implanted into their floor and sides over a considerable area. These microbes are not washed out by marked hæmorrhage but are implanted in the lymph in the lymph-spaces. This lymph, being under capillary pressure, merely oozes out and forms a stagnant culture-medium for the in-

¹ Brit. M. J., 1915, II, 420, 520, 727.

fection. Its antibacterial power is soon exhausted and is not readily renewed, as in hemorrhage. Again, the leucocytes, coming slowly into the injury zone and being unable to actively attack the infection, choke up the surrounding tissues, forming an area of isolation. Thus the infection becomes imprisoned and, upon spreading, forms a cellulitis or gas gangrene, if it breaks through the surface, as so often happens, the ordinary infected wound occurs. This sequence always takes place whenever lymph-spaces are infected, or the wound becomes sealed with lymph (lymph-bound).

NATURE OF MICROBIC INFECTION IN WOUNDS

The infection of wounds consists of:

1. Serophytes, which live and multiply in the serum.

2. Serosaprophytes, which develop in the blood only after its antitryptic property is exhausted. (This antitryptic property is the ability of the blood to inhibit bacterial digestion of the blood albumins to form a suitable pabulum.)

3. Secondary serophytes, which can only live in the serum after a heavy implantation.

In the first group are the streptococcus and staphylococcus. The former is found as a lancet-shaped diplococcus bent into an angle. On agar, the colonies are more opaque, larger, and less sharply defined than those of the classical streptococcus; the most marked characteristic being the freedom of growth in normal serum, a moderate implantation becoming visible within three to five hours. The author believes this to be the enterococcus of the French and that it is of faecal origin, having repeatedly isolated it from the faeces. The staphylococcus, being so widely distributed and having such pronounced serophytic properties, is bound to appear in nearly all wounds.

In the second group belong those microbes commonly found in suppurations.

In the third group are found the bacillus perfringens (welch), bacillus pyocyaneus, and bacillus proteus. The first also has a faecal origin, but only survives in wounds after a heavy implantation; therefore, if the blood fluids and leucocytes can be brought to bear on this bacillus, little is to be feared from it.

A detailed description is given in the original of the various methods used for making cultures in serum.

RESPONSES OF THE WOUNDED TO INFECTION AND BLOOD CHANGES INDUCED BY AUTO-INOCULATION

Emphasis is put on the fact that it is the changes taking place in the blood stream, and the reaction to the infection with a systemic immunizing response, that influence the course of the infection; the surgeon plays merely a secondary part either helping or hindering nature. Data were furnished by the following:

1. *Measurements of the antitryptic power of the serum.* This power serves as a check on all micro-

bic growth, when lost, the complementing, opsonic, bactericidal, and coagulating powers of the blood also disappear. With serosaprophytes it prevents growth, with imperfect serophytes it inhibits growth, and its strength determines the strength of growth of the serophytes proper. Therefore, an increase of this power would operate as a non-specific factor in immunization, and in a previous lecture Wright has shown that 24 to 36 hours after infliction of the wound, the antitryptic index has risen far above the normal level. This likewise followed to some extent after inoculation with typhoid, streptococcus and staphylococcus vaccines; it would also explain certain unexpected therapeutic effects lying outside the range of the particular vaccine employed.

2. *Pyo-culture.* The method of making these pyo-cultures is described in detail. The value of this procedure lies in the fact that it reveals to what point the blood fluids of the patient, would, without aid from the leucocytes, be capable of protecting themselves against a microbial implantation, especially of microbes from the wound; in other words, a forecast of the future of the wound.

An increase of microbes in the pyo-culture indicates an unsatisfactory wound condition, due either to a defective immunizing response or to poor drainage. On the other hand, if the microbes definitely fail to grow in the culture, it shows that the patient is making a good immunizing response and the prognosis is favorable.

3. *Measurements of the opsonic power of the serum.*

Changes in the serum, gradually rendering it a more uncongenial culture medium for microbial growth, have their counter part in changes rendering the microbes an easier prey for phagocytes. All displacements or movement of the wound, no matter how slight, operate as auto-inoculations and are followed by classical negative and positive phases in the serum changes.

4. A study of the emigration response of the leucocytes. Experiments to date show that in those who have made an immunizing response to the infection or inoculation of vaccines, there is an emigration response of the leucocytes strikingly greater than of normal man.

5. A study of the bactericidal power of the whole blood was arrived at by implanting streptococci in blood-clots.

Wright first discusses former experiments in which the blood failed to destroy the streptococcus implantations, contrary to therapeutic and clinical data. A flaw in the technique was to blame.

It was then assumed that if the implantation was made into the serum of the blood-clot, the leucocytes would be unable to attack the microbes and the implantation would grow. On the other hand, if the implantation was made directly into the part of the clot which consists of corpuscles, the leucocytes could attack the microbes and kill them off.

A very interesting experiment, following this

theory, is described in detail, and bears out these assumptions. Streptococci implanted into the solid part of the clot were destroyed, while if implanted in the fluid part (serum) they developed. Therefore, the most favorable arrangement of the blood for combating streptococci infection is the "agathotrophic" arrangement, i.e., the leucocytes in the front rank, with the blood fluids behind; the least favorable being "cacotrophic," i.e., the blood fluids in front with the leucocytes behind.

THE TREATMENT OF MICROBIAL INFECTIONS OF WOUNDS

1. Treatment.

Today, we ask of antiseptics two testimonials: (a) their bacterial efficacy in albuminous fluids, and (b) their penetrating power.

(a) Under ordinary circumstances, it is practically impossible to sterilize pus from foul, suppurating wounds by any ordinary antiseptic. This may be arrived at by mixing an amount of antiseptic with about the same amount of pus; islands of pus will form, intersected by channels of antiseptic. Excessive dilution of the pus obviates this.

(b) Penetrating power, implying diffusion into or through, is governed mainly by the concentration of the discharging fluid and the receptivity of the recipient. In the usual antiseptics, we have agents which, owing to their toxicity or escharotic properties, must be used in high dilutions; the recipient, on the other hand, a thick, highly concentrated fluid; hence, conditions are practically hopeless for the penetration of the antiseptic. This is illustrated by superposing, on infected blood, carbolic acid of various strengths, with no seeming effect on the microbes in the clot.

These points are discussed, especial attention being directed to those who know *a priori* that antiseptics must be useful in wounds, having been taught by the antiquated laboratory experiments which did not take into account the above two points.

Wright emphatically states that neither he nor any of his coworkers have seen a single infected wound favorably influenced by antiseptics. As for those unfavorable reports of competent men, Wright considers the menstruum used and incidental circumstances largely responsible. On the other hand, strong antiseptics by coagulating the surface albumin of the wound, and thus imprisoning the infection, work decided harm. Concerning the application of antiseptics to the skin around the wound, in the majority of cases this causes the formation of blebs, which offer ideal culture media for serophytic microbes (streptococcus and staphylococcus).

Antiseptics that are specifically bacteriotropic concentrate their chemical energy directly on the microbe, and to this group belong salvarsan and optoquin (ethyl hydrocuprein). From some few experiments it would seem that these kill off the streptococci growing in serum, especially optoquin which acts in very high dilutions.

2. Treatment by surgical procedures.

(a) Ablation of heavily infected and infiltrated wound lining. H. M. W. Gray has demonstrated by a long series of cases that this ablation followed by thorough cleansing and immediate suture will, in suitable cases, abort wound infection. It is especially applicable to those "gouged out" and "punched in" wounds of the soft tissues. But what amount and kind of infection can be allowed to remain is an undecided question.

(b) Secondary suture of wounds. The success or failure of this procedure depends largely on the condition of the surfaces to be sutured and the number of microbes on those surfaces. With few microbes and a profusion of leucocytes success may be looked for, and vice versa.

In regard to the first point, if the lymph-spaces communicate freely and are filled with a clear fluid, the infection is purely a surface one. As regards the leucocytes, microscopical slides are prepared from the surfaces and the number and condition of the leucocytes directly observed.

In the suturing, the wound should be only partially closed or "bridged" by deep sutures that are to be withdrawn as early as possible. The inter-spaces should be further irrigated and drained.

3. Treatment by phylacagogic methods.

These methods consist in the application of heat, electricity, various chemical agents, sunlight, vaccines, and saline solutions. Wright confines his discussion, however, to strong (hypertonic) and weak (physiological) salt solutions.

PHYSICAL AND PHYSIOLOGICAL ACTION OF HYPERTONIC SALT SOLUTIONS

Physical action. Wright explains in this section, by means of several experiments fully described, the power of pure salt or a heavy salt solution to stimulate the processes of diffusion and infusion. Likewise, the power of this salt to abstract fluids from gelatinous media in the ratio of very many volumes of fluid abstracted or diffused for one of salt lost or infused. This result is the foundation of the use of hypertonic salt solution in infected wounds. The fallacy that the fluid abstracted by this solution from the tissues is non-albuminous, on account of passing through an animal membrane, is exploded upon boiling the fluid drawn by a cube of salt from a tube of blood-agar and obtaining a heavy albuminous precipitate.

Another point demonstrated by experiment is the ability of the salt to diffuse through all the fluids of the wound, thus reaching its uttermost confines; the salt in the lower reaches of the wound attaining the highest concentration and thus acting as a lymphagogue, promoting the flow of lymph and thus mechanically washing out the infection.

Physiological action. Strong salt solutions, about 5 per cent, acting on a medium containing leucocytes, i.e., pus and blood, will promote auto-indigestion of the leucocytes and provide a nutrient substratum which will, however, favor the growth

of microbes when the excess of salt is removed. An experiment is given demonstrating the different action of strong and physiological salt solutions on the leucocytes of a clot. With strong solutions, the leucocytes retreat and allow the fluid elements to come to the front. This would give rise to a strong serum outflow, thus arresting all suppurative process.

The effect on the wound condition and the microbial infection is the result of the physical and physiological effects, together with the direct action on the microbes. Concerning this latter point, it has been demonstrated that diluted 5 per cent salt solutions will absolutely prevent any bacterial growth in the wound. In sloughing of indurated wounds, this power of autodigestion and lymph-flow stimulant results in a loosening of the sloughs, dispersion of the induration, and consequent freedom from pus; the lymph spaces show macroscopically an absence of leucocytes or bacteria.

The blood elements are now in a "cacotrophic" arrangement which renders the wound extremely susceptible to further microbial infection. To prevent this, the blood elements are reversed and arranged in the "agathotrophic" manner, by substituting for the 5 per cent solution the physiological, or 85 per cent solution.

Effect of physiological salt solution. By experiment it has been shown that this solution brings the leucocytes to the surface by chemotaxis, and especially the polymuclear cells; within a few hours the clean wound begins to clothe itself with a gray film of leucocytes.

The surface of the wound is a very unsuitable media for leucocytes which begin to die if allowed to remain exposed, and thus provide the microbes with eminently favorable culture media. To prevent this, immediate approximation of the wound surfaces is necessary, i.e., secondary suture as soon as the leucocytes are apparent on the clean surface.

4. Treatment by vaccines.

This treatment is very intimately linked up with physio-agogic methods of treatment in order to stimulate a general emigration response of leucocytes (which have responded locally to the salt solution). These vaccines should contain the microbes least easily killed by the protective elements of the blood, i.e., streptococci, staphylococci, and bacillus welchii.

The first favorable time for vaccine use is immediately after the wound is received. A second favorable time is at the beginning of the spread of the infection, particularly in streptococci infections, such as erysipelas, cellulitis, or gas emphysema. A third time is when secondary suture is indicated.

Wright admits that statistical data along these lines is not as trustworthy as that, for instance, in typhoid insulations, owing to extraneous circumstances that may very probably affect the course of the infections; but there is, however, all that an exacting mind could require in the way of inferential evidence of the value of immunizing response in wound infections.

SCHEME FOR PHYSIO-AGOGIC TREATMENT OF WOUND INFECTIONS

This section deals with the treatment as applied solely to military surgery.

Treatment in the first-aid post. Here, hemorrhage is arrested, the wound cleaned, and spasmata applied. Also a prophylactic injection of "anti-gangrene vaccine" containing streptococcus, staphylococcus, and welch bacillus, is given. No apparatus is required beyond the usual outfit.

Treatment in the field ambulance. In addition to the usual duties of cleansing the wounds and applying clean dressings, simple operations for removal of foreign matter and providing drainage should be instituted. In the latter procedure should be included the application of hypertonic salt solutions, both by syringing and packs. In ordinary painful wounds, 5 per cent salt solutions are to be used; in the sloughing wounds not over 10 per cent, and the skin edges must be protected by vasoline. If the discharges are confined in the bandages the addition of 5 per cent sodium citrate will prevent coagulation.

Treatment at casualty clearing stations. Besides the more extensive operations, the efforts of these hospitals should be directed toward regaining the ground lost upon the journey; i.e., dispersion of induration and freeing of lymph-bound wounds.

Treatment at base hospitals. Operations here consist of those necessary in cases of spreading infections, i.e., cellulitis and gas gangrene, and those requiring special operative skill or apparatus. Here the hypertonic and normal salt solutions should be used as previously indicated; this in turn to be followed by secondary suture.

Treatment of infections in unopened joints and serous cavities. In these cases, the continuous irrigation of physiological salt solution is recommended without the wide opening of the joint or cavity, except to provide effective drainage. Full antiseptic and aseptic precautions are to be used, however, in the handling or the operating of each case, even though the use of antiseptics in the wound proper be useless.

CONCLUSIONS

1. Formerly the essential treatment of infected wounds consisted in efficient drainage, antiseptic irrigations, and clean dressings.
2. These ideas have, in the present war at least, been found inadequate.
3. Every wound should be considered infected.
4. The rules and ideas herein laid down are the sum and substance of the newer ideas in the treatment of wound infections.
5. To insure success the full program should be carried out, not merely portions.
6. This will require thought, verification, occasional new departures and a certain degree of acquaintance with laboratory technique.

P. M. CHASE.

GYNECOLOGY

UTERUS

Clark, J. G.: What Do the Newer Methods of Treatment Offer the Patient with Malignant Disease of the Uterus? *N. F. M. J.*, 1915, cii, 485.

The author discusses the relative merits of the various methods of management of malignant disease of the uterus in the hands of expert operators both in this country and abroad.

Schauta and Wertheim, Cheron and Duval, and the London Radium Institute have treated series of cases that indicate that radium may prove of positive value in the management of a certain class of these cases. This is especially true in inoperable cancer. Bumm of Berlin is a staunch advocate of the use of X-ray in these cases, and in his opinion a method will be devised for its use here without the danger of serious burns resulting. He is even inclined to believe this method may supersede the use of radium for these cases. The conclusions are:

1. Up to the present time there is not sufficient evidence in favor of radium to justify its use as a substitute for surgical measures in operative cases.

2. As a forerunner to and following an operation it is unquestionably advisable.

3. In inoperable cases it should invariably be tried, for some apparent cures have resulted and in others amelioration of symptoms resulted.

4. A serious disadvantage in the use of radium is that it occasionally produces widespread necrosis, leaving vesical and rectal fistulae in the wake of its destructive action.

Chemical means for the cure of cancer have so far made only a temporary place in the literature. The treatment of cancer by cancer extracts and the various serums has also proved worse than valueless.

Percy's method of using a "cold cautery" at 50 to 55° C. may be used with profit in inoperable cancer. The author believes where radium is not available it is the duty of every surgeon to equip himself with this apparatus.

In conclusion the author says: "From this review of the newer therapeutic methods in the treatment of carcinoma, I feel that we may conclude that definite progress has been made, but that as yet no genuine panacea has been discovered or even forecast by reports of the most optimistic champion of the various methods considered." C. D. HORMS.

Boldt, H. J.: High vs. Low Degrees of Heat as Palliative Treatment for Advanced Cases of Cancer of the Uterus. *Tr. South Surg. & Gynec. Ass., Cincinnati*, 1915, Dec.

The author claims for the galvanocautery treatment, first brought to notice and prominence by the

late Doctor Byrne, of Brooklyn, N. Y., that it gives more satisfactory results in advanced cases of cancer of the uterus than any other method of treatment with which he is acquainted.

Radium and X-ray treatments, even with the newer methods, have not been satisfactory. The intravenous injections, or the intramuscular injections of various medicaments recommended for experimentation from time to time, and from which improvement or even cures have been reported, have not, in his hands, had any discernible good effect.

Galvanocautery treatment has stood the test of time, and it is proved by clinical experience that patients properly treated thereby live longer and are freer from distressing symptoms. It, too, is a comparatively safe therapeutic agent, when used in suitable cases; that is, for patients in whom the disease has not already advanced too far, so that the bladder and rectum would probably not be injured by a thorough application. Percy's claim that the application of lower degrees of heat, so low that carbonization of the tissues is not caused and applied for a much longer time, have a deeper destructive influence appealed to the profession, and Boldt gave it a thorough test for two years, although in no cases did he see a superior clinical advantage.

Recently it was shown to Boldt to be a fallacy, by an autopsy and a careful study of the tissues from a woman who had died eight days subsequent to the heat application for two and a half hours, according to the rules laid down by Percy. Here it was illustrated that directly beyond the cauterized zone there were actively proliferating cancer-cells. Percy's experimentation was done on dead tissues (beef), and the destructive action did not penetrate beyond the superficial structure.

Boldt believes, therefore, that he has proved beyond a doubt that the application of heat so low as not to char the tissues, though the desiccation method be used precisely according to the directions of Percy, is of no more value in hindering cell-growth in the depth of the tissues than high degrees of heat, as were formerly and are now again used by him. The technique advocated by Boldt has moreover the advantage of being able to do the cauterizing in from twenty to thirty minutes, and he believes that the destruction of tissue is carried deeper, only a shell of the cervico-uterine structures being left. The degree of heat employed by Boldt is much higher than that which was advocated by Byrne. While the electrode was at a cherry-red heat when applied to the tissues by Byrne, this heat was soon diminished; but Boldt turns on more current to keep it at that degree while it remains in

contact with the tissue, and when, in his opinion, a fairly thick layer of carbonized structure has been produced, more current is turned on to raise the heat of the dome electrode to a light red. The electrode must be taken off to make frequent examinations during the process, to determine how much tissue has been burned out, and to burn off the carbon accumulated upon the electrode.

Percy deserves much credit for calling attention to the desirability of opening the abdomen so that the vaginal operator's work may be controlled by the hand of a competent assistant, which is even more important when high degrees are used than when the Percy technique is employed. The cauterization should never be done without the employment of a cooling speculum; and the improvement that Percy has made on the cooling specula devised by Boldt is also advantageous, particularly in the case of spiculous vagina.

It requires from one to two weeks for the carbonization eschar to be thrown off, and then there is slight sanguinous oozing, which may be controlled by the use of acetone, used as advised by Gellhorn, or a strip of styptic gauze may be packed into the cavity. But what is still better is to resort to the desiccation process by the low heat method. With this method it is not necessary to use the heat more than twenty to thirty minutes, and no carbonization must be caused; but one must be careful not to use too much pressure with the electrode, since, if the first treatment has been properly done, only a shell of cervico-uterine structure is left. An opening of the abdomen is not necessary for the second cauterization, or rather desiccation.

For additional after-treatment the use of radium is desirable since there is no doubt that it is of benefit in some cases of cancer. A capsule containing 75 milligrams may be placed in the cavity and held by a gauze tampon from twenty-four to forty-eight hours. This is to be repeated once a week for several weeks.

No patient, after the cautery operation has been done, should be permitted to be out of constant observation until the carbonized eschar has been completely thrown off and danger of a possible secondary hemorrhage dismissed.

The ligation of the internal iliac arteries, as originally advised by Pryor, and oöphorectomy as a preliminary step, is a good procedure. Boldt has been able to verify the claims for the ligation of the arteries, made by the late Pryor, in that it lessens the bleeding and the discharge in the cases of patients with so-called inoperable cancer of the uterus.

Treber, H.: Results of Radiotherapy of Carcinoma of the Uterus and Breast from May, 1911, to December, 1914. (*Ergebnisse der Röntgen- und Radiumtherapie bei Karzinomen des Uterus und der Mamma*, Mai, 1911 bis December, 1914). *Strahlenther.*, 1916, 11, 102.

The author reports his experience in 100 cases of carcinoma—84 of the uterus and 16 of the breast

—treated with roentgen and mesothorium rays. With the roentgen rays he irradiated fields on the abdomen and through the vagina, for periods of 3 to 4 weeks, with hard penetrating rays. On the abdomen he filtered with 3 mm. aluminum, 1 mm. hard rubber, and 2 to 4 layers of buckskin; in the vagina 1 to 3 mm. aluminum. For his mesothorium technique he used 50 to 60 mg. mesothorium. He gave series of treatments 3 to 4 days apart, leaving the mesothorium in place 1 to 24 hours. He gave these doses every two weeks, and in the intervals gave intravenous injections of enzytol and barium-radium-selenium.

Of 25 cases of carcinomata of the uterus that had had radical operation 10 had recurrence; of these 4 died and 2 withdrew from treatment. The remaining 13 are free from recurrence so far. Of 6 carcinomata of the breast, almost all of which were operable, 13 remained free from recurrence after radiotherapy, one of them dying of pneumonia; 11 had recurrence. Of 50 inoperable cases of carcinoma of the uterus, some of them treated with mesothorium and some with roentgen rays, 14 were cured, that is, no carcinoma could be demonstrated clinically; 15 died, 3 withdrew from treatment, 3 grew worse, and the remaining 20 were most of them markedly improved. Of 100 carcinoma patients not less than 32 seem to be cured at present.

A. Gross.

Geist, S. H.: Essential Uterine Hemorrhage. *Surg., Gynec. & Obst.*, 1915, xvi, 354.

Experimentally it has been demonstrated that the ovaries possess a secretory activity and that the secretion or secretions are essential for the proper development of the genital system and for the proper function of these organs. Transplantation experiments have shown that normal menstruation is dependent on this ovarian activity. Just which glandular structure, i.e., follicle, corpus luteum, or interstitial gland, is more important cannot yet be determined. The weight of evidence seems to point to either follicle or corpus luteum or both.

Pathological hemorrhage, as in those cases occurring without gross lesion either neoplastic or inflammatory, is probably dependent on some functional disturbance of the ovary. Many writers have described histological lesions in the uterine structure or in the ovaries which they believe to be the cause of the condition.

Twenty-five uteri from cases of so-called "fibrosis uteri" (eighteen with the adnexa) were carefully studied to ascertain if there were any histological lesions constantly found. The changes in the mesometrium and blood vessels were not constant; they appeared as an increase in fibrous tissue and a sclerotic condition of the vessels, but these same conditions were found in the controls who had borne children. All the histological variations could be attributed to pregnancy and its subsequent transmutations and involutions. The endometrium shows a constant picture, that of a marked thickening with tortuosity of the glands resembling the premenstrual

phase of the mucosa and with cystic dilatation of some of the glands and edema of the stroma cells. This is not considered the cause of the bleeding but the result of the same stimulus, probably ovarian, that initiates the pathological hemorrhage.

The examination of the ovaries shows no distinct lesion but the histological picture does not seem to be one of hyperactivity. This type of bleeding is considered to be due to an abnormal ovarian function, whether of the follicle, or of the corpus luteum, or both cannot be determined. The idea that just such conditions can be due to a disturbed balance in the function of any one or all the glands of the endocrinous system is entertained.

Treatment, it is hinted at, will be along the lines of apotherapy when the etiology can be clinically differentiated.

ADNEXAL AND PERIUTERINE CONDITIONS

Mayer, A.: Operative Treatment of Diseases of the Adnexa and Their Relation to Peritonitis (Beitrag zur operativen Behandlung entzündlicher Adnexerkrankungen und ihren Beziehungen zur Peritonitis). *Deutsche Zeitschr. f. Chir.*, 1915, cxxxiv, 393.

Mayer refutes the arguments of Amberger, who published an article advocating a more active operative treatment of inflammatory diseases of the adnexa in the acute stage. Mayer denies the frequency of spontaneous rupture of tumors of the adnexa followed by peritonitis, and also the malignancy of puerperal septic diseases of the tubes. On the other hand he points out the danger of all minor gynecological operations, such as curettement, etc., when there is a coexisting encapsulated salpingitis. He says that Amberger's comparison between appendicitis and encapsulated salpingitis is not justified. He thinks without doubt that operation is imperatively indicated in appendicitis, but he does not believe in the application of the same surgical principles to tumors of the adnexa. The fear that surgeons have of operating on tumors of the adnexa in the acute stage is justified, and their position, he holds, is not overthrown by Amberger's arguments.

A. Goss.

Gardner, W. S.: Prolapsed Ovaries. *J. Alumni Ass. Coll. Phys. & Surg.*, 1915, xviii, 72.

Nervous phenomena coming on regularly during the week preceding the menstrual flow is stated by Gardner to be characteristic of ovarian disturbance. Such symptoms plus pelvic pain and the palpation of the ovaries in the cul-de-sac justify the diagnosis of prolapsed ovaries, and constitute the indication for operation. Nearly all prolapsed ovaries are enlarged and their ligaments are elongated.

Operation should aim to diminish the weight of the prolapsed ovary, shorten its ligament, and if retroversion has occurred, an appropriate operation for its correction should also be done.

W. H. Cady.

Hoffman, L. H.: Polypus of Fallopian Tube. *J. Am. M. Ass.*, 1915, lxx, 1370.

The patient, aged 30, married several years, had never become pregnant, although she had used no preventive measures. Menstruation had always been regular, moderate in quantity, and of about four days' duration. The April and May menses were normal. The June period was on time, but the patient menstruated several days longer than usual, with a day's cessation, and a few days of a dark bloody discharge with clots, accompanied by colicky pains in the lower abdomen and slight abdominal distention.

The cervix was conical, of normal consistency. The uterus was normal in size, in axis of pelvis not fixed. A boggy semifluctuating mass was palpable in Douglas' cul-de-sac. The right adnexa was palpable and no abnormality was felt. A mass was felt in the left parametrium about 5 cm. in diameter, immobile, separable from the uterus and tender to the touch. A diagnosis of ectopic gestation was made.

When the peritoneal cavity was opened by median abdominal incision, some fluid, blood, and clots escaped. The left adnexa was represented by a mass 5 cm. in diameter, embedded in blood-clots, and ruptured on its superior margin near its distal end. This adnexa was removed typically and the clots evacuated from the peritoneal cavity. The abdomen was closed in four layers. Recovery was uneventful.

The pathologic report showed rupture of the fallopian tube, which contained a polypus, 2 cm. in diameter, and coagula.

EDWARD L. CORNELL.

Taylor, H. C.: Tuberculosis of the Uterine Appendages. *J. Am. M. Ass.*, 1915, lxx, 950.

The frequency with which tuberculosis is found in the uterine appendages depends largely on the regularity with which these organs are subjected to microscopic examination. If the nature of the process is determined only by the gross examination, the number of cases of tubal tuberculosis reported will be small; if, however, every tube and ovary that is removed is examined microscopically, the number will be found to be surprisingly large. It is probable also that the frequency of genital tuberculosis, as tuberculosis of other organs, varies in different locations and among different people. If gonorrheal salpingitis predisposes to tuberculous salpingitis, as it probably does, then naturally tubal tuberculosis will be found more frequently among the class most frequently subject to the former disease.

There are three modes of infection in genital tuberculosis: (1) through the blood and lymphatic systems; (2) from neighboring organs; and (3) by ascending infection through the vagina.

In order to consider the treatment properly, it is necessary to understand the influence which the tuberculous salpingitis exerts in this general process (1) on the life of the patient, (2) on the health of the

patient, and (3) on the extension of the infection. The influence of the tuberculous salpingitis on the life of the patient is comparable to that of other forms of salpingitis. Very rarely does a tuberculous salpingitis alone seem to be the cause of death.

The frequency with which a tuberculous salpingitis produces a general peritoneal tuberculosis is still in dispute. Some observers believe that it is the usual rule that the peritoneal infection is from the tube and advocate the removal of the uterus and both appendages for tuberculous salpingitis to prevent the occurrence of tuberculous peritonitis. The weight of evidence is against this extension. It is probable that a tuberculous inflammation in the tube would cause the formation of adhesions about it in the same way as in other types of salpingitis. These adhesions would tend to localize the infection and prevent the general peritoneal tuberculosis.

The frequency with which healed tuberculous lesions are found in the tubes with apparently normal peritoneum is additional evidence that tuberculosis of the tubes does not usually extend to the peritoneum.

If by proper treatment the symptoms subside and the infection is not extending, the author prefers to delay operation. If the disease is progressing, an operation is indicated. The influence of a tuberculous salpingitis on the general health in itself is usually not great. The disease usually runs a chronic course and frequently gives no local or general symptoms.

The ultimate value of the tube must also be considered in deciding on the treatment of tuberculous salpingitis. It is theoretically possible for a tuberculous salpingitis to subside, leaving a patent tube and allowing the patient to become pregnant. It is doubtful if this often occurs. Furthermore, it is doubtful if it is wise that such a patient should become pregnant for fear of again starting the tuberculous process. There is, therefore, no indication to delay an operation otherwise indicated in order to conserve the tube.

The treatment of tuberculous salpingitis is considered under two classes: (1) those cases in which the tube is involved as a part of the general peritoneal tuberculosis and (2) those cases in which there is only a local peritoneal involvement.

If there is a general peritoneal tuberculosis, that and not the salpingitis is the condition that determines the treatment. If, however, the abdomen is opened for such a condition, usually the tubes, if accessible, should be removed. The chances of the tubes becoming diseased from the peritoneum is so great and the chances of regaining their function so small that they should not be retained. If inaccessible they should not be removed unless they are distended, because the additional peritoneal traumatism necessitated by the removal of the tubes would increase the chances of infection. If the tubes are distended, it is usually best to remove them even if covered by adhesions.

If there is no general peritoneal tuberculosis, the treatment of the tuberculous salpingitis is practically the same as for other forms of salpingitis. This is true because if there is no general peritoneal tuberculosis, it is practically impossible to diagnose a tuberculous salpingitis from other varieties.

At the operation no attempt should be made to save any part of either tube. Usually (90 per cent of cases) both tubes are involved. If the ovaries are diseased or if the patient is near the menopause, the ovaries should be removed. If the ovaries are removed or if the patient is near the menopause, the uterus should also be removed. It is difficult to decide regarding the uterus in young women with normal ovaries.

The post-operative treatment of tuberculous salpingitis is important. The probability of other tuberculous foci and the personal predisposition of the patient are indications for the best hygienic surroundings with regard to rest, food, air, etc.

EDWARD L. CORNELL

EXTERNAL GENITALIA

Boldt, H. J.: Intermediate Trachelorrhaphy, Its Use as a Prophylactic Against the Pernicious Effects Sometimes Caused by Laceration of the Cervix. *J. Am. M. Ass.*, 1915, LV, 1311.

The author pleads for such procedure, the prompt repair of cervical tears and to do this before pathologic changes, incident to the trauma, manifest themselves, and especially that it may be done when the sacrifice of material tissue is not a necessity. His justification lies in the fact that those who have made a careful study of the results of cervical tears almost invariably verify the assertion concerning their deleterious effects.

His present method of repair is simpler than formerly — so simple, in fact, that any one with a little surgical ability can easily adopt it.

The patient is placed in the lithotomy position and the customary disinfection attended to. If she is not hypersensitive and not nervous, no anesthetic is required, for the operation is not very painful.

The cervix is pulled down with a pair of well-working bullet forceps and exposed with vaginal retractors. The bullet forceps are then adjusted, one pair in the line of the cervical canal on the anterior lip and one pair similarly applied on the posterior lip. With a narrow but very sharp scalpel — sharp especially at the point — a superficial film of tissue is scraped off the torn surface, taking particular care that the angles of the tear are made raw. A full-curved, medium-sized Martin needle, which has cutting edges, is used for sewing, though one may use any other needle if more accustomed to it. A No. 2 chromic catgut is passed so as to include the entire depth of the tear. Usually two sutures suffice for each side of the tear. Sometimes only one suture is required for one side, it frequently being the case in instances of bilateral tear

that the extent of the tears on the sides is unequal. This also holds equally good for stellate tears. Care should be exercised in tying. The surfaces should be brought together just snugly, never too tight, so that the sutures may not cut into the tissue. No after-treatment is necessary and the patient may be about as usual after the operation.

It will be seen from the foregoing that the operation is not applicable to any case in which the tear has existed long enough to cause pathological changes in which scar tissue is present in the angles. In all such patients the scraping or making the torn surfaces raw does not suffice. That is why it is particularly applicable for primiparae who have not previously sustained a tear, and in the case of every primipara it should be part of the accoucher's duty to make a visual inspection in about four to six weeks subsequent to delivery and then to repair any existing laceration, unless it be of negligible extent.

It is understood that in scraping the edges, scrupulous care should be taken to avoid the mucosa of the cervical canal.

EDWARD L. CORNELL.

Foskett, E.: A Case of Mercurial Poisoning from a Vaginal Douche. *Am. J. Obst.*, N. Y., 1915, lxxi, 639.

The author reports a case of mercurial poisoning which followed a douche containing three tablets of bichloride, 7.3 grains each, dissolved in a cup of water. The patient at once felt a burning sensation in the vagina and felt so bad that she went to see a physician who ordered douches, ointment in the vagina, and albumin water by mouth. The author saw her three days later and found that the vulva and vagina were covered by a white sloughing surface. Salivation was present and the mucous membranes of the mouth, pharynx, and vulva were also white and sloughy.

There was a marked suppression of the urine. On the third and fourth days she passed about an ounce in twenty-four hours, but after that it gradually increased and on the tenth day she passed 56 ounces. The urine showed albumin, granular and hyaline casts, but no mercury was found.

On the ninth day, she had bleeding from the nose and mouth, and vomited blood-clots; her throat was very sore and oedematous, following sloughing of the surface. On the eleventh day blood-clots and old blood appeared in the stools. During the night the patient failed physically and mentally and bleeding continued from the stomach and intestines. She died on the twelfth day.

The author believes that the condition of the mouth and bleeding of the stomach and intestines in the later stages indicates that the mercury was excreted by the mucous membranes. C. H. DAVIS.

Mayo, C. H.: Repair of Small Vesicovaginal Fistulae. *Tr. West. Surg. Ass.*, Des Moines, 1915, Dec.

The author describes the operation which he has successfully employed for the past 20 years in the repair of small vesicovaginal fistulae.

An incision is made through the vaginal mucosa extending completely around the fistulous opening for about a quarter of an inch, or less, from its margins. The vaginal mucosa is dissected toward the opening, care being taken not to break through at the margin. This makes a little cup or funnel-shaped opening projecting into the vagina. The circular dissection is carried deeper around the fistula, approaching no nearer than one-eighth of an inch to the margin, its depth penetrating to the mucosa of the bladder but not through it. This leaves a little bell or funnel-shaped opening with mucous membrane which is connected with the mucosa of the bladder and projects into the vagina. A ligature carrier is passed through the urethra into the bladder and through the fistula into the vagina. A suture is passed through both walls of the funnelled mucosa on each side of the ligature carrier. The two ends of the silk suture are threaded into the ligature carrier which is withdrawn from the bladder and urethra. The ends of the suture projecting from the urethra are drawn upon, and with a little aid the fistulous tract starts inverting. As soon as the mucosa disappears a circular suture of fine chromic catgut is applied, a little more traction is used on the ends of the long suture and a second purse-string suture of catgut is applied. The vaginal side is then closed either by a circular suture of the chromic catgut or by interrupted sutures as seems best. This inversion turns the mucous surface into the bladder and leaves a healing surface within the tube. One of the long ends of the suture projecting from the urethra is rethreaded and by a needle is sutured to the skin of the labia. The two ends are tied at this point, making slight traction. A self-retaining catheter (Pezzar type) is inserted into the bladder and the patient is instructed to rest on her side or on her face, to keep the fistulous area free from urinary pressure.

After four days it is necessary to watch the catheter carefully to see that sediment or phosphatic deposit does not obstruct its lumen. In some cases irrigation is necessary. However, the long suture attached to the inner side of the surface of the fistula and passing through the urethra acts as a safety valve of leakage should the catheter become temporarily plugged. After a week the repair is usually solid, but it is better to keep the patient on her side or face for a few days longer, that no undue strain may be placed on the fistulous area, and during this time it is best to keep a catheter in, or if it is removed to have regular periods for passing it. The suture from within the bladder either cuts itself out with the slight traction or it may be drawn out by cutting one side where it is attached to the skin.

MISCELLANEOUS

Kosmak, G. W.: Gynecological Aspects of Backache. *N. Y. M. J.*, 1915, cii, 587.

Gynecologically speaking, backache is limited, according to Kosmak, to painful sensations in the

lumbar, sacral, or coccygeal areas. It is usually attributed, more particularly by the laity, to uterine displacements, but this is not necessarily the case, for it is a well-known fact that women with marked pelvic disturbances may have no backache, whereas those with only slight pelvic lesions have most severe backaches.

The main etiological factors which go to produce gynecological backache are:

1. Nervous disturbances of idiopathic origin.
2. General asthenic conditions.
3. Uterine displacements.
4. Rheumatic or gouty diathesis.
5. Sarcoid-like affections.
6. Following operation where the patient has been long in the dorsorecumbent position.
7. Affections of the coccyx.

In the treatment of gynecological backache a diagnosis as to the causative factor or factors in each instance must precede any method of treatment. The mere presence of a gynecological lesion or lesions is not sufficient to finally determine the treatment.

HARVEY B. MATTHEWS.

Curtis, A. H.: Laboratory Diagnosis of Chronic Infections of the Urinary Tract in Women.

Surg., Gynec. & Obst., 1915, xxx, 423.

Chronic infections of the urinary tract can be best diagnosed by one who is actively engaged both in clinical work, including cystoscopy, and in laboratory study.

In the study of the bacteriology of the urine by modern cultural methods, anaerobic cultures are essential. Most satisfactory results are obtained with shake cultures in 1 per cent dextrose-asches-agar and with aerobic and anaerobic blood agar slant cultures.

Some new points in technique are suggested as follows:

1. In cases with bladder irritability which yield clear, bacteria-free urine, cultures from the traumatized urethral canal or from the introduction of a probe into Skene's ducts may demonstrate the cause of infection.
2. When bacteria are widely scattered or grow with difficulty, a mixture of the urinary sediment

with blood, followed by making a large number of asches blood agar tubes of high dilution, results in conditions favorable for the development and isolation of the bacteria present.

Regarding vaccines, the author makes the following statement: "To emphasize a belief which is becoming more firmly rooted as my experience increases: Autogenous vaccines, in infections other than those with bacilli of the colon group, are sometimes beneficial, but do not commonly cure the patient. Colon bacillus vaccines, on the other hand, yield a high percentage of cures. Failure to obtain results with carefully prepared and administered autogenous colon bacillus vaccine is indicative of trouble greater than a simple infection, notably kidney abscess, stone, retention of urine, or complicating tuberculosis."

The source of even small amounts of pus in the urine should be investigated, and should not be carelessly ascribed to vaginal contamination. Persistent pyuria in the absence of an easily demonstrable bladder lesion is held to be almost invariably due to kidney disease.

A method of examination of obscure cases of renal tuberculosis is as follows: Provided the lungs are normal, potassium iodide is given for a period of several days, this is followed by the administration of 0.1 mg. old tuberculin 24 to 48 hours before examination. Massage of the kidneys several times daily in conjunction with the iodide and tuberculin tests aids in the production of a focal reaction. Finally, liquids are limited to a minimum before collection of specimens with the twofold object of irritating the kidney through concentration of solids and increasing the number of bacteria in a given quantity of urine. Urine so obtained is examined after centrifugation in a high-power centrifuge, which is held to be vastly superior to those in ordinary use. In the event of negative findings many specimens are examined. Petroff's cultures and the injection of medium-sized guinea-pigs are used in addition.

Although an advocate of functional kidney tests, Curtis warns against the tendency to lay undue stress on their value at the expense of careful routine examination.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Spalding, A. B.: Relative Frequency of Ectopic Gestation. *J. Am. M. Ass.*, 1915, lxx, 1156.

In this paper a statistical study of a definite number of patients is made in order to estimate the relative frequency of ectopic gestation to disease in general, to women's disease, to pregnancy, and to abortion.

From July 1, 1912, to May 1, 1915, 36,668 patients were registered in the out-patient clinics of the Leland Stanford University, School of Medicine. Of this number 2,955 were treated in the women's clinic. In the clinic fairly extensive histories of the patients were taken and a careful pelvic examination made, as well as considerable routine laboratory work started.

The author found ectopic gestation 13 times in 36,668 patients, or once in 2,820 cases of illness such as a general practitioner would encounter in a practice covering the diseases of men, women, and children. There were 13 cases of ectopic gestation among 2,955 women with pelvic symptoms, or one case in 227 such as come to the specialist; and 13 cases of ectopic gestation among 1,704 cases of pregnancy, or one in each 131 pregnancies.

Considering the pathologic diagnoses which were made in the laboratory, 86, or 5.33 per cent, of the pregnant patients were sent to the hospital because of bleeding, and were curetted. A study of these curettements showed that 13 of the 86 patients, or nearly 17 per cent of possible abortions, were flowing because they were suffering from misplaced pregnancy.

This does not indicate the relative frequency of abortion to pregnancy, which has been estimated by Tausig as high as 1 abortion to every 2.3 labors, but does call attention to the possibility of confusing ectopic gestation with incomplete abortion and should put the general practitioner on his guard when treating such cases.

A clinical summary of the cases reported is presented in chart form and from this it will be seen that the average age, the multi-gravida, the number of preceding induced and spontaneous abortions, as well as attacks of gonorrhœa, the period of relative sterility, and the microscopic findings all point strongly to the clinical idea of Tait that many of the cases of ectopic gestation trace their etiology to a preceding pelvic infection. Gonorrhœa often plays the minor rôle and abortion, associated as it so often is with a more or less noticeable attack of salpingitis, is the major predisposing cause for this frequent, dangerous anomaly of pregnancy.

EDWARD L. CORNELL.

Fowler, R. H.: Inaugural Symptoms of Ectopic Pregnancy. *Am. Med.*, 1915, x, 751.

Although in his series of 11 cases the diagnosis of ectopic pregnancy was not made prior to rupture, the author believes the condition should frequently be recognized before the onset of alarming symptoms.

The chief symptoms of value are said to be pain, disturbance of menstrual function, suspicion of pregnancy, and genital hæmorrhage, the latter being scant and bright as compared to the usual menstrual flow. Proper diagnosis is almost impossible when ectopic symptoms are engrafted upon those of pre-existing pelvic lesions. Gentleness in the examination of suspicious cases is urged.

WM. H. CARY.

McPherson, R.: Report of a Case of Spontaneous Rupture of the Uterus. *N. Y. St. J. Med.*, 1915, xv, 407.

The author reports a case of a patient 33 years old, a II-para, admitted to the hospital with the following history: previous health good; denied venereal infection; no miscarriages. At the time of admission she considered herself five months pregnant.

The day before admission, she was seized with sudden sharp abdominal pain and felt somewhat faint. There was no accident, fall, blow, or other emergency to account for these symptoms. Although feeling rather uncomfortable she continued about her work. The family physician who was summoned gave her some medicine to relieve the pain but did not examine her. The following day she had more pain and early in the evening her condition became so critical that her physician decided to send her to the hospital.

When seen about 9 p.m., she was in extreme shock, pulseless, and with all the signs of abdominal bleeding. A saline infusion and the usual shock treatment were given, which failed to have any beneficial effect. Under very light ether anaesthesia, the abdomen was opened, and the cavity found entirely filled with blood. A five months' fetus was free in the cavity and attached by the umbilical cord to the placenta which was still in the uterus. The uterus was ruptured transversely across the fundus. The fetus and placenta were extracted and a rapid supravaginal hysterectomy performed; the abdomen was rapidly wiped dry and the wound closed with through-and-through sutures of silk-worm gut, the time consumed in the operation being about eighteen minutes.

The condition of the patient had not changed and another saline infusion was given with very little



Fig. 1.



Fig. 2.



(Courtesy Johns Hopkins Bulletin.)

Fig. 3.



(H. A. Seppensen.)

Fig. 4.

result. As soon as preparations could be made the case was transfused, giving the patient about 500 cc. of her husband's blood, into a vein of the left arm. She was unconscious, breathing jerkily and stertorously, absolutely waxy in color, no pulse at the wrist, and heart-beats only faintly obtainable with the stethoscope.

At the close of the transfusion she was conscious, pink checked, with pulse at the wrist of good quality, although rather rapid. Her convalescence was unmarked by complications. She reported back to the hospital one month later feeling and looking perfectly well, with 4,500,000 red cells and hemoglobin 80 per cent.

The diagnosis was rupture of the uterus; anomaly of the left fallopian tube. Wassermann reaction negative.

The following lessons are to be learned from a study of this case:

1. That an extensive rupture of the uterus can occur without apparent cause or reason, and that after occurrence it may be some hours before the symptoms are sufficiently marked or grave to cause serious alarm.

2. That no matter how badly off the patient may seem to be, prompt and proper operative measures may save her life.

3. That the value of actual blood transfusion in these cases is inestimable and more like a miracle than almost anything in surgery.

4. That it behooves the physician to make a careful examination of a patient whenever she complains of abdominal pain. RALPH H. KUENS.

LABOR AND ITS COMPLICATIONS

Stephenson, H. A.: *The Mechanism of Labor in Spontaneous Evolution.* *Bull. Johns Hopkins Hosp.*, 1915, xxvi, 331

The author reports two cases which are of interest for several reasons. First, on account of their rarity, as they are the only examples of birth by spontaneous evolution observed in 13,000 consecutive labors in the Obstetrical Department of the Johns Hopkins Hospital. Second, they show that the final stages of the process may be completed with great rapidity, the first child having been born practically in the ambulance, while the second was expelled so rapidly that the patient could not be transported to the hospital. Furthermore, the first case shows that the entire duration of labor may be relatively short, being only eight hours. Finally, the first case is of particular interest from the fact that it was possible in the laboratory to force the child through a normal pelvis by mechanism identical with that observed at the bedside, and to photograph its various stages.

Fig. 1 shows the first stage of spontaneous evolution; namely, the impaction of the shoulder into the pelvis, together with the molding and transverse compression of the fetus.

Fig. 2 shows the condition of affairs after the

arm had prolapsed through the vulva. Note the molding of the entire fetus, the attitude of the head, the elongation of the neck, and the swelling and discoloration of the prolapsed arm. This last condition seems to afford indubitable evidence that fetal death had occurred comparatively late in labor and after the arm had prolapsed.

Fig. 3 represents the crucial stage in the mechanism and shows conditions which are particularly difficult to explain. The occiput has rotated almost directly anteriorly and lies just above the right horizontal ramus of the pubis and the symphysis, while the neck is in contact with the inner surface of the symphysis and has become so stretched and elongated as to permit the left shoulder to emerge beneath the pubic arch. At the same time the buttocks are seen to have emerged from the outlet with their anterior surface in contact with the inner surface of the prolapsed arm. The position of the buttocks is very unusual; it is particularly difficult of explanation and seriously complicates the classification of the mechanism. It can be explained only by assuming that after the left shoulder had emerged beneath the pubic arch the buttocks had been forced down between the thorax and the posterior pelvic wall so that they eventually emerged behind the prolapsed arm. It is apparent that such a maneuver must have necessitated great compression and an extreme degree of torsion of the body, which could scarcely be compatible with the life of the child. Consequently, it is permissible to assume that fetal death must inevitably have taken place at that time, if it had not occurred previously.

Fig. 4 shows that after delivery of the shoulder and buttocks the child had undergone a movement of rotation by which the prolapsed arm returned to the side of the mother toward which it was originally directed, thus bringing the occiput under the pubic arch in the most suitable position for easy expulsion.

In the second case the evolution was clearly effected by the mechanism described by Douglas, but it is not so easy to explain which mechanism was concerned in the first case. EDWARD L. CORNELL.

Arnold, J. O.: *Birth Mortality, with the Presentation of Some Practical Helps in the Prevention and Treatment of Asphyxia Neonatorum.* *Am. Med.*, 1915, x, 561.

It is difficult and next to impossible to obtain accurate figures as to the birth mortality, chiefly because the statistics concerning the stillborn are incomplete and because there is no commonly accepted definition of the term "stillborn child." However, assuming 5 per cent to be a fair estimate for the stillbirths the total number for the entire country would be close to 140,000 annually. From the table of infant mortality, exclusive of stillbirths it is found that approximately 230,000 infants die annually in the United States in the first year of life. More than 25 per cent die the first week, and

more than 42 per cent die the first month. The number of deaths for the entire country for the first week is approximately 50,000 annually and for the first month approximately 97,000. About one third of these latter deaths the author attributes to intra-partum causes. It is evident, therefore, that two of the most important problems in the conduct of labor are: (1) study of the intra-partum condition of the child, and (2) successful resuscitation of the newborn.

Every precaution should be taken to protect the child from the dangers of asphyxiation. One should not give an anesthetic or use pituitrin, morphine, etc., without watching carefully the effect on the child.

In order to properly treat the asphyxiated newborn, it is necessary to know something of its causes. The most frequent of all causes is some interference with the fetal circulation. The child may become asphyxiated from pressure on its brain. Anesthetics, morphine, and other narcotics also endanger the child either by interfering with its oxygen supply or by direct poisoning.

The kinds of asphyxia relate to the length of time the child has been deprived of its oxygen. If the time has been short or the circulation partially obstructed we have the so-called "blue asphyxia," in which the skin is congested and purple, the body firm, reflexes present, heart and cord pulsations good, but the child for a time fails to breathe. If the obstruction is complete or lasts for a considerable time, we have "white asphyxia" in which there is deathly pallor, reflexes absent, body relaxed, no pulsation in the cord, and very feeble heart action.

In the treatment of "blue asphyxia" the author considers tossing and swinging, and the hot and cold water processes questionable. He considers mouth-to-mouth insufflation the most effective treatment in very severe cases. He recommends most highly a mucous aspirator, with which he says that he is able to resuscitate all cases of "blue asphyxia."

For combating "asphyxia pallida" he recommends the American-made instrument known as the lung master.

C. D. Holmes.

PUERPERIUM AND ITS COMPLICATIONS

Bleas, F.: Puerperal Infection. *Clinique*, Chicago, 1913, 1919, 228.

Bleas discusses puerperal infection under three heads: septicemia, sapremia, and pyemia. Septic endocarditis, pericarditis, and phlegmonia alba dolens are to be considered forms of pyemic infection. A mild fever of septicaemic or septicemic type may be caused by septic wounds of the lower genital tract while the uterus may remain free from infection. These parts, therefore, always require careful examination. Any fever arising during the puerperium should be regarded as infection until proved otherwise.

F. C. Irving.

Buoss, P.: Mortality from Puerperal Fever Since 1900 (*Sterblichkeit an Kindbettfieber seit 1900*). *Zürcher, C. Geburth. u. Gynäk.*, 1913, 189, 115.

The author gives a thorough statistical study of the subject, giving the figures not only for the different cities and provinces of Germany, but for Sweden, Norway, Italy, Austria, and the cities of Vienna, Madrid and Paris. The whole period is divided into two subperiods. The years from 1901 to 1905 show an increase in the mortality in some cities, while in the past five years there has been a decrease everywhere except in Italy, Alsace-Lorraine, Paris, and Vienna. The lowest mortality in recent years was in Basel, 0.47 per thousand, and the highest in Berlin, 5.44 per thousand.

Comparing the increase in the first five years with the decrease in the last five in the different states and cities, some show a net decrease varying from 0.14 per thousand to 0.50 per thousand, while others show an increase varying from 0.06 per thousand to 0.78 per thousand and amounting for the whole of Germany to 0.17 per thousand. Of the last period of five years the second half shows better results than the first half, and particularly the last year, for during this year there has been a decrease in nearly all cities and states.

A. Goss.

MISCELLANEOUS

Bronfenbrenner, J., Freeland, J. R., Schlesinger, M. J.: Serum Skin Test for Pregnancy and Different Pathological Conditions. *Am. J. Obst.*, N. Y., 1913, LXIII, 599.

The authors review in a general way the various difficulties in the technique of performing the Abderhalden test for the serum diagnosis of pregnancy. In the serum skin test which the authors originally described, the appearance of the split products depends on the autodigestion of human serum and therefore the toxicity of the resulting material was not uniform as tested on guinea pigs.

In their present modification the serum skin test is performed so as to test the split products of the autodigested serum upon homologous animals.

The serum of the patient is injected intraperitoneally into a normal guinea pig thus transferring the specific properties of the patient's serum. Twenty-four hours later this guinea pig is bled and its serum is placed upon ice in a test-tube with a suitable amount of substratum (placenta, tuberculin, tumor tissue, etc., as the case may be). Next day—twelve to eighteen hours later—the serum is centrifuged off and placed in the incubator for from twelve to eighteen hours. During this incubation the serum undergoes autodigestion and toxic split products of the serum are formed, as has previously been demonstrated.

At this time 0.05 ccm. of such autodigested guinea pig serum is injected into the skin of a normal guinea pig on a spot previously shaven. From twelve to twenty-four hours later a very distinct skin reaction is observed on the place of the injection

if the serum of the patient used in the test contained specific antibodies. Instead of injecting the autodigested serum into the skin 0.5 ccm. may be injected into the heart or into the vein of a normal guinea pig, in which case the guinea pig will die with symptoms of acute anaphylactic shock if the serum was specific.

The authors consider that the use of thimbles and nishydria offers a source of error in reading the results of the Abderhalden test and they offer the above substitute which they believe is more accurate.

C. H. DAVIS.

Warren, S. P.: Two Cases of So-called "Missed Labor." *Am. J. Obst.*, N. Y., 1915, lxxii, 603.

The author has had two cases of this rare obstetrical freak, the first occurred in 1884 and is recorded in "Lusk's Midwifery," the second was in 1914. The author finds that there are several points of similarity in the clinical histories. Both were intra-uterine pregnancies, as was proven at the operations. In both, the irregular positions—transverse and breech—probably contributed to the inertia. Both the children lived on for several weeks beyond term, just so long as life was possible under advancing gestation. The crisis of pregnancy had passed by as shown by the consensus of events; the course of childbirth began, normally, with the discharge waters, then the vital powers, forgetting that the uterus had not been emptied, went on to finish the normal cycle of pregnancy, parturition, and involution. The operation showed that both uteri were in a final stage of involution.

The first patient died and the second made a good recovery.

C. H. DAVIS.

Ehrenfest, H.: The Reappearance of Menstruation After Childbirth. *Am. J. Obst.*, N. Y., 1915, lxxii, 577.

The author has studied the histories of 200 private patients detailing 309 births. In a total of 257 lactating women, menstruation reappeared in 132 instances, or 51.3 per cent, within twelve weeks postpartum. This percentage of early menstruation among primiparous women amounts to 52.3 per cent.

Among 257 lactating women, in 209, 81.3 per cent, menstruation appeared before the child had been weaned. Only 48 mothers remained amenorrheic during the entire period of lactation. Excluding from this number, the 58 cases in which nursing had been stopped within three months, so as to eliminate all the cases in which the lactation process had not been fully established, there remained 199 patients who had actually nursed a child at least four months. They represent 171 cases, 85.9 per cent, of menstruation during lactation and 28 cases, 14.1 per cent, of complete amenorrhea.

Of 36 cases in which the child was weaned at nine

months, 84.3 per cent menstruated during lactation and 16.6 per cent remained amenorrheic during the entire period of lactation.

Considering this same question in relation to primiparous women, the author found that the percentage of the menstruating mothers amounted to 84.6 per cent for all cases and to 90.5 per cent for those who continued to nurse for more than three months.

From a review of the literature the author finds that most of the published statistics indicate that in the majority of cases menstruation will reappear before the child has been weaned. To quote a few of them: Heil found in 200 women, representing 234 lactations, 62.5 per cent of the cases menstruated during lactation; Ponsoye figured about 50 per cent as menstruating; Sundin in 335 nursing women, from 55 to 59 per cent; Essen-Moeller in 428 women found that about 50 per cent menstruated. However, some authors give lower percentages: Remfry, approximately 43 per cent; Brickner, 43.3 per cent in 442 nursing mothers; and Glass, 40 per cent in 1,200 cases.

In summing up the statistical study of the problem of lactation amenorrhea the author states that clinical experience evidently sustains the following views:

A debilitating influence exerted immediately by labor and later by the loss of body fluids during lactation with rare exceptions temporarily arrest ovulation. As soon as the disturbed equilibrium is restored the ovary resumes its function of ovulation, and the first corpus luteum sends its specific hormone to the endometrium. The response of the latter probably to a certain extent is dependent upon the anatomic condition of the uterus. If normal, a typical menstrual flow ensues; if subinvolved, or for other reasons hyperæmic (retroflexed), the reaction may be unusually strong; on the other hand, if the uterus is in an atrophic condition, it may require the stimulation from more than one ovulation until it becomes anatomically restored to the degree of resuming its function. As a rule, menstruation continues practically regularly during lactation when once reestablished. The debilitating effect of lactation is obviously dependent upon the general condition of the woman. Therefore, usually the disturbance in the equilibrium of the body fluids ends sooner and menstruation reappears earlier in the strong and healthy woman. For the same reason the amenorrheic state in general will last longer in the sick or weak woman, in the primigravida, whose labor is as a rule longer and more exhausting, and in the woman suckling a large child. But in the majority of women the equilibrium is regained before they have actually ceased to nurse their children, and therefore, in the majority of instances menstruation reappears before the function of lactation is ended.

C. H. DAVIS.

GENITO-URINARY SURGERY

KIDNEY AND URETER

Corbett, J. F.: *The Suprarenal Gland*. St. Paul M. J., 1915, LVII, 433.

In the light of the work of Elliott and Cannon, Seeley and Lyon, the author sums up his observations as follows:

In a long series of animals reduced to traumatic shock by the usual methods, a great degree of epinephrin exhaustion was found to exist. In this series the final appearance of the animal was that of complete shock—mental apathy, evinced by unconsciousness with no ether, muscular relaxation, pale mucous membrane, and low blood pressure. The average blood pressure was 12, and the average epinephrin content 0.08. In a few instances the blood pressure remained at 30 to 45, suddenly fell to 0, and the epinephrin content in these cases was 0.11. The average time to produce complete traumatic shock was six hours.

Very little is known of the secretion of epinephrin, but from the fact that the adrenal ordinarily contains enormous loads to tide the individual through emergencies it would seem that the storage and discharge factors are paramount over the secretory rôles. Further than this, the amount of epinephrin needed to maintain vasoconstriction that exists in shock are evidence of the continued output of that secretion as long as an available supply exists. The adrenal cortex in shock is apparently unaffected in any other experiment.

H. A. MOORE.

Kirkendall, B. R.: *A New Method of Passing the Wax Tip; Modification of the Technique*. *J. Am. M. Ass.*, 1915, LV, 1253.

The author describes in detail a new method of passing the wax tip and also a modification of the technique. He emphasizes the following points:

1. The wax tip will diagnose ureteral calculi unaided.

2. In conjunction with roentgenoscopy, it will rule out or make positive a shadow in the line of the ureter.

3. It will diagnose ureteral calculi which have been entirely missed by the roentgen rays.

4. The gynecologists for several years have been able to locate the site of ureteral calculi by passing a ureteral catheter, with a series of wax bulbs, through the open cystoscope.

In his opinion this method is much simpler and has more possibilities than any other previously used. The main facts about the technique are:

(1) The wax tip must not touch any metal in either entering or leaving the bladder. (2) This is a com-

plished by inserting the rubber tube in the catheter sheath and passing the wax tip through the catheter. Then the rubber sheath is withdrawn and the catheterizing part of the instrument threaded onto the urethral catheter.

The presence and the accurate determination of the exact location of a ureteral calculus can be easily determined by passing a bougie, equipped with multiple wax tips or bulbs, through an operating cystoscope supplied with a catheter tube to prevent marring of the wax by the instrument. For several months he has used with complete success a rubber catheter sheath for the passing of wax tips in a manner similar to that described by Hinman. Instead of using a bougie or catheter with a single wax tip, it has been found to be equally practical and of far greater advantage to use a bougie equipped with a wax tip and a series of from four to six wax bulbs placed about two inches apart, beginning about two inches from the wax tip and approximately covering 12 inches of the bougie—the normal length of the ureter. The author has found that this method is equally adaptable for use in both males and females.

W. E. LOWRY.

Crouse, H.: *The Triangle of Petit in Kidney Surgery*. *Ann. Surg.*, Phila., 1915, LXII, 451.

This article deals with a new route for kidney surgery, which, in the author's experience, has been successful in most pathological conditions met while dealing with the kidney in a surgical way, and is properly denominated the triangle of Petit route.

A detailed description of the method of procedure is given, with illustrations. The description is as follows:

Start the skin incision about three-fourths of an inch below the twelfth rib, slightly posterior to the anterior border of the latissimus dorsi, sweep straight down to within 1 inch of the crest of the ilium, then forward in a semilunar curve to about 2.5 centimeters below and in front of the anterosuperior spine of the ilium. This incision should extend through the skin and adipose tissues only, retraction of which will expose the triangle of Petit at the lower portion of the straight incision, just as it begins to sweep forward. The anterior border of this triangle is formed by the external oblique muscle, the posterior border by the latissimus dorsi, and the inferior border by the crest of the ilium. The anterior floor of this space is formed by the internal oblique, the posterior border of which muscle is slightly anterior to, or even with, the anterior edge of the latissimus dorsi. When these muscles bounding the triangle of Petit have been exposed, the fingers of each hand of the operator should be forcibly

pushed through the space between the external oblique and the latissimus dorsi, and the muscles forcibly and widely retracted; this retraction readily exposes the next structure—the lumbar fascia. The hands then being removed, forcible retraction of this area is made by the assistant, while the lumbar fascia is incised or nicked by the operator; in many cases this fascia can be punctured readily by the index finger, thus avoiding aid from the assistant. Again, with the fingers of each hand forcibly separate the latissimus dorsi, external oblique, and lumbar fascia. Substitute a three-bladed automatic retractor of the abdominal type for the fingers, with the auxiliary blade at the superior angle of the triangle of Petit, or the space made by the hand retraction of the operator; drop the two lateral blades into the space of the lumbar fascia, forcibly and widely retract the instrument, strongly pull up the superior blade, and the perirenal fat is immediately exposed. If the stretching has been sufficiently forcible, there is an anteroposterior operative area of about 3 or 4 inches, which is amply wide to deal with the kidney in any way desired, whether nephropexy, nephrectomy, or nephrotomy.

The author has also used this route successfully on the right side for doing appendectomies and for inspection of the gall-bladder and duodenum. The left-sided incision gives access to the tail of the pancreas, the spleen, and the splenic flexure of the colon.

He recommends this method and believes that it has marked advantages over other incisions, i.e., those of Koenig, Mayo, Kelly, and Edebohl, not only in rapidity, but in that it allows a return to normal anatomical relationship at the completion of the operation.

J. DELLINGER BARNEY.

BLADDER, URETHRA, AND PENIS

Judd, E. S.: Foreign Bodies in the Urinary Bladder. *Tr. W. of Surg. Ass., Des Moines*, 1915, Dec.

This paper embraces a report of 7 cases of foreign body found in the urinary bladder, exclusive of pieces of broken catheter or surgical instruments. This series includes three hairpins, a 22-rifle bullet, a piece of chewing gum, a fragment of bone, and a part of a jack-knife blade. Bodies lodged in the bladder are prone to incrustation from salt deposits, though some materials, as this piece of bone, seem to be immune. The stone with the foreign body as a nucleus is usually of considerable size before the patient's symptoms compel him to seek the aid of a physician. Pain and burning on micturition, pus and sometimes blood, frequency or retention and marked urgency are the symptoms most often complained of. Attention is called to the fact that foreign bodies found in the bladder have usually gained entrance through the urethra, though in two cases here reported, namely, the bone and jack-knife blade, this could not have occurred. There is no question but that these foreign bodies got into the bladder through the side wall, producing few

if any symptoms during the time they were passing in, though very careful examination of the inner lining of the bladder at the time of operation did not reveal any scars or permanent injury to the bladder wall.

Goldberg, B.: Gunshot Injuries of the Bladder (*Beitrag zur Kenntnis der Blasenschüsse*). *Ztschr. f. Urol.*, 1915, ix, 161.

The author reports three cases of his own which recovered, as well as 11 cases from the recent literature.

The greatest danger to patients with injuries of the bladder comes from the involvement of the peritoneum in the injury. The second great danger is infiltration of urine. Infection can take place after gunshot injuries of the bladder either from the wound or through the urine. Diagnosis is made by palpation, roentgenography, and cystoscopy. The last sequela of bladder injury is the formation of fistule; they may arise from the wound itself or from the rupture of suppurating urine infiltrations. They may open externally on the perineum, scrotum, thigh, buttock, or abdominal wall, or into the peritoneum or intestinal canal, especially the rectum.

The mortality in the cases reported by the author was 25 per cent; but no general conclusion as to the mortality can be drawn from these cases, which were observed in home hospitals, after return from the field.

Recent injuries of the bladder and peritoneum should be operated on at once, but unfortunately this is not always possible. In extraperitoneal injuries of the bladder the chief point is to secure and maintain free discharge of the urine. Generally this is secured by drainage through the wound into the bladder and by a retention catheter passed through the urethra into the bladder; if this is not sufficient the bladder should be opened and drained at its most dependent point through the perineum. Bullets or foreign bodies should not be removed until later. Urinary antiseptics should be given internally from the time of injury, and the bladder should be irrigated with urinary disinfectants.

A. Goss.

GENITAL ORGANS

Loewe, G. M.: A Case of Congenital Perineal Testicle. *J. Am. M. Ass.*, 1915, lxx, 1176.

The author reports a rare type of congenital perineal testicle.

A boy of 12 had complained for the past 6 months of a dull aching pain in the perineal region, recently increasing in intensity.

Examination showed the right side of the scrotum atrophied, and the left testicle normal.

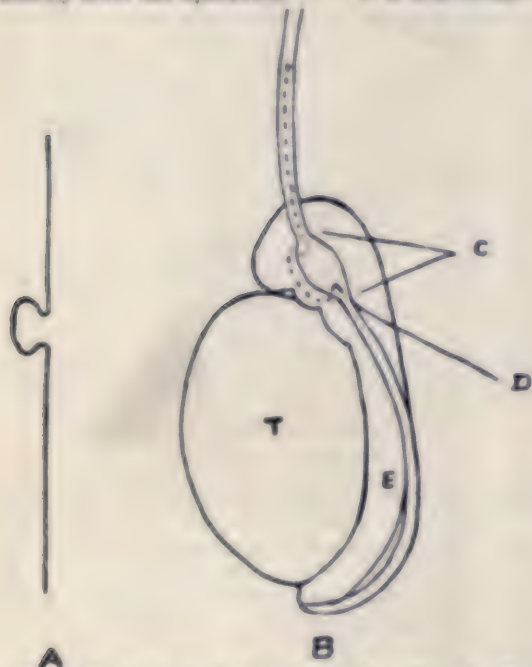
The perineal region showed an oval body, about 2.5 by 1.5 cm., located 5 cm. anterior to the anus and 2 cm. to the right of the median raphe. The mass gave a testicular sensation on pressure. The

mother stated that the absence of the right testicle had been noted about two weeks after the child's birth.

At operation (Reck) an incision about 3 cm. long was made over the right external abdominal ring. The cord was seen emerging from the ring and extending down to the ectopic perineal testis. The gubernaculum testis which was attached to the lower pole of the testicle was excised just below its attachment and the somewhat underdeveloped testicle placed into the scrotum in the usual manner. The recovery was perfect. **THOMAS DRONISOWITZ.**

Bernart, W. F.: Epididymis-Vas Anastomosis for Sterility. *N. Y. M. J.*, 1913, 60, 848.

Contrary to the common supposition, the author believes that the lack of success in this operation is not due to the vas failing to remain patulous, but rather to the tendency of the wound in the head of the epididymis to close too rapidly. To prevent this the author inserts a looped wire in the wound as shown in the accompanying drawing. The free end of the wire is brought out of the scrotal wound and the entire wire is removed in from twenty four to thirty hours. This operation has proved successful in eight consecutive cases compared to about 50 per cent of failures otherwise. The wives of four of these eight patients became pregnant shortly after the operation. **B. S. BARRISCOMB.**



Bernart's anastomosis for sterility in man. A, silver wire with loop. B, wire introduced into the lumen of the proximal portion of the vas deferens and the loop embedded in the head of the epididymis. T, testis. E, epididymis. C, point of anastomosis. D, distal portion of wire which protrudes from scrotal wound.

Wolbarst, A. L.: Observations on Incipient Hypertrophy of the Prostate. *J. Am. M. Ass.*, 1915, 55, 1137.

In regard to the diagnosis of hypertrophy of the prostate, Wolbarst draws attention to several points. He insists upon the necessity of examination of the reflexes to eliminate spinal lesions as the cause of irritability or retention. He considers the use of the cystoscope as a routine procedure in diagnosing hypertrophy, not only unnecessary, but undesirable. In the majority of cases the occurrence of increased frequency, particularly at night, of increased urethral length, and of residual urine in men of 50 or more, is sufficient basis for the diagnosis of obstructing prostate. A prostate may be very large, but unless it obstructs it need not be removed.

Wolbarst believes that some prostates enlarge to a certain degree, then cease growing. Because of this fact and because of the sequelae sometimes found after prostatectomy, he believes that operation should not be done until the bladder has shown itself unable to express practically all of its contents. A bladder with a residual of only one or two ounces can be strengthened by distention and lavage to such an extent that operation may in some cases prove unnecessary. **G. G. SMITH.**

Wiener, J.: Suprapubic Prostatectomy in Two Stages. *Ann. Surg.*, Phila., 1913, 56, 454.

The first two-stage operation for prostatic hypertrophy to be reported was performed by the author in 1903, though Lillenthal subsequently published the record of a case he had operated upon by this method in 1896.

The two-stage operation has gained in favor slowly but steadily, more slowly abroad than in this country, till at present there is a very general feeling that this method gives the patient a much better chance to survive the operation than the one-stage procedure. Of course many of the patients who are subjected to the two-stage operation when this is used as a routine would survive were the one-stage method used, but unfortunately it is not possible to recognize these cases in advance.

The two-stage operation keeps the patient in the hospital a somewhat greater length of time, especially in infected cases, but only a few days or a week, and this is of little consequence in comparison with the decreased danger to life. The stay in bed is not prolonged, as it is possible and advisable for the patient to be up between the two operations.

The author uses nitrous oxide and oxygen for the removal of the prostate. Done in this way he has found that there is very little shock. It has been the author's habit to tell the patients that the prostate has been removed at the first operation, and when it comes time a week or more later for the actual prostatectomy, when the maximum of general improvement has been obtained, to announce that a painful dressing is to be performed, and that a little gas will be given. **S. W. M. SHERMAN.**

SURGERY OF THE EYE AND EAR

EYE

Bane, W. C.: Use of the Sideroscope for Detecting Iron in the Eye. *J. Ophth., & Oto-Laryngol.*, 1915, ix, 311.

The sideroscope is an instrument which consists of a magnetized steel rod one-twelfth inch in thickness and about 4 inches in length, suspended by a silk thread 3 to 4 inches long from an adjustable aluminum wire. The thread and rod are protected from currents of air by the ends of the rod being covered with glass tubes about one-twelfth inch in diameter. On the center of the rod is attached a small mirror. When using the instrument it is placed on a solid base, away from metallic substances and electrical currents, and the ends of the rod pointing north and south. Usually the room is darkened so that a beam of light can be thrown on to the mirror, from which the light is reflected on to a scale, the latter being so placed that the light will strike the scale at the zero point.

In order to use the instrument, the tube covering the south end of the magnet is placed upon the magnetized eye. The light on the scale changes position as the magnet is attracted or repelled, this change varying in rapidity and extent according to the size and proximity of the magnetized metal.

It is advisable to use this instrument if an X-ray is out of the question, before attempting an extraction with a magnet.

The author has devised a cheap sideroscope which consists of a perpendicular glass tube 1.5 inches in diameter and 11 inches in height. Two tubes 0.5 inch in diameter and 1.25 inches long are fused into the perpendicular tube about 3.5 inches from the top. One of the lateral tubes is open to allow the insertion of the magnetized rod. The large tube is mounted on a triangular block of wood having brass screws in each angle to provide for balancing the magnet. The silk thread carrying the magnet is attached to an aluminum wire in a rubber cork in the top of the main tube.

Orto M. Rott.

Barkan, H.: Post-Operative Detachment of the Choroid, with Especial Reference to Elliot's Operation for Glaucoma. *J. Am. M. Ass.*, 1915, lxx, 1520.

After a clear summary of the literature on choroidal detachment after operation and a discussion of the same, Barkan reaches the following conclusions:

1. Clinically demonstrable post-operative detachment of the choroid takes place after cataract operations, with or without iridectomy, in about four per cent of cases; in Elliot's trephine operation, in

about ten per cent; in Lagrange's sclerotomy, in about 30 per cent. It does not occur in linear extraction, or in simple iridectomy.

2. The *sine qua non* for its existence is low intra-ocular tension, caused by abnormally rapid escape of aqueous humor through the wound, extending over some interval.

3. The chamber is not shallow or absent because of the detachment; the detachment is secondary to the condition of the chamber.

4. The fluid responsible for the detachment is derived, probably, from the choroidal blood-vessels, and not improbably from the veins.

5. Choroidal detachment is of relatively frequent occurrence after Elliot's trephine operation, and should, if for statistical purposes only, be looked for and its occurrence noted in all cases of Elliot's operation.

EARLE B. FOWLER.

Fenton, R. A.: Oxycephalic Exophthalmos, with Traumatic Rupture of Both Eyes. *J. Am. M. Ass.*, 1915, lxx, 1538.

Fenton reports a case of an oxycephalic adult, including photographs and roentgenograms. Exophthalmos was bilateral and complete, but only after an injury to one eye and repeated corneal ulcers on the other was vision greatly impaired. The patient's mentality was very good. Fenton asks whether early double subtemporal decompression might not save these patients from many complications.

EARLE B. FOWLER.

Bruecken, A. J.: Fibro-Adenoma of Ciliary Body. *Arch. Ophth.*, 1915, xlv, 490.

In the routine examination of an eye removed from a man of 63 on account of a sloughing cavity in the region of the inner canthus, the diagnosis of which was not microscopically determined, the eye was found to be normal externally except that it was quite flaccid; on section the sclera, iris, choroid, and retina showed nothing of special note; the ciliary body was well developed and no evidence of a nodule was seen in it.

The history of the case was that besides a lesion indicating enucleation, the patient had worked all his life in steel mills and occasionally had particles of metal get into his eyes, but with no after-results.

Microscopically there was found in the anterior portion of the ciliary body, situated in the apical part of the ciliary process, a small, irregular, round or oval, tumor mass not over 0.75 mm. in diameter, made up of aggregations of epithelial cells embedded in a homogenous acellular substance having fine fibrillation.

There was no change in the tissues surrounding

the tumor, which was not pigmented, showed sharp localization, presented no definite tubular arrangement of its epithelial cells, and the absence of blood-vessels or any suggestion of them, was one of its prominent features.

The haphazard disposition of the epithelial elements with no evidence of a proliferative tendency and the excess of fibrous tissue seem to the author to indicate that the tumor mass represented an epithelial inclusion with but little growth of the epithelial elements.

S. S. Hows.

EAR

Clay, J. V. F.: The Influence of Nasal Accessory Sinus Disease upon the Ear. *Hahnemann Month.*, 1915, 1, 669.

The author calls attention to the frequency with which diseased conditions in the nose and accessory sinuses give rise to aural disturbances. For instance, the acute infections give rise to acute otitis media.

Chronic nonsuppurative diseases of the sinuses give rise to chronic middle ear catarrh. Chronic suppurative disease of the sinuses cause tubal thickening and obstruction with secondary middle ear catarrh.

Otto M. Rott.

Schmiegelow, E.: Removal of Tumors of the Acoustic Nerve Through the Labyrinth (*Beitrag zur translabirinthären Entfernung der Acousticustumoren*). *Zschr. f. Ohrenh. u. f. d. Kehlk. d. Laryngee*, 1915, LXIII, 1.

Schmiegelow has successfully operated on two tumors of the acoustic by the translabyrinthine route, the details of which he gives in this article. The method of operation is as follows: First, the so-called radical operation is performed; that is, the middle ear is freely laid open. Then, sparing the facial nerve as much as possible, if its function has not been already destroyed, the labyrinth and the apex of the pyramid are removed sufficiently so that the dura is laid bare beneath the superior petrosal sinus. After opening the dura a good view of the pontocerebellar angle is obtained.

As compared with Krause's paracerebellar method, through the squamous portion of the occiput, the translabyrinthine route has the following advantages: (1) The way through the labyrinth is shorter than that in the paracerebellar method. (2) The operation is extradural until the tumor is reached. (3) There is much less danger of hemorrhage in the translabyrinthine method. (4) The vital centers in the cerebellum and medulla oblongata are much less exposed to trauma.

In the paracerebellar method injury and shock are often observed. Of course the technical diffi-

culties are greater for the surgeon than for the otologist, who is thoroughly familiar with the surgery of the temporal bone. The effort to spare the facial nerve often leads to almost insuperable difficulties. But if it has already been destroyed by the tumor, as it generally is, no attention need be paid to this point. Early diagnosis is of great importance in carrying out this method, for very large tumors cannot be removed by the translabyrinthine route.

A. Goss.

Emerson, W. R. P.: Acute Otitis Media in Infancy and Early Childhood. *Boston M. & S. J.*, 1914, April, 616.

The reason otitis media is so often overlooked in infancy and early childhood is because the symptoms do not point to the ear. The symptoms may be those of pneumonia, of meningitis, abdominal or simply an intensification of symptoms due to the disease which the otitis complicates, and unless the ears are examined as a matter of routine, the otitis would not have been discovered. Five cases are reported in none of which was there earache. In two cases the symptoms were abdominal, in one meningeal, and in two general, associated with fever.

The author wisely lays down the rule that in infectious diseases and in all diseases of the respiratory tract the ears should be examined at every visit of the physician, with as much reason as he would examine the heart in rheumatism or the abdomen in typhoid fever. As to prevention, measures should be inaugurated at once in every case of contagious disease and of affections of the respiratory tract in children, to keep the nasopharynx clear and so maintain drainage through the eustachian tube. This can be accomplished by instilling into each nostril two or three times daily three drops of 10 per cent argyrol solution, and applying a spray of soothing solution to the inflamed membranes, as for instance menthol 5 gr., benzoinol 1 oz.

At the onset of the otitis media the following procedure is recommended to open the tube: A mixture of 4 drops of adrenalin (1:5000) and cocaine one-half of one per cent instilled into the nostril. This should be followed in five minutes by 3 to 4 drops of a 30 per cent solution of argyrol. If symptoms do not subside the drum should be incised before bulging occurs.

Every child after an attack of acute otitis media, should have his epipharynx examined and treated by a specialist.

The author speaks highly of the electric ear instrument as it causes less disturbance to the child; and in infancy at least a better examination can be made.

Otto M. Rott.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Orton, H. B.: **Spindle-Cell Sarcoma of the Nasopharynx.** *Laryngoscope*, 1915, xxv, 709.

The case is reported of a patient 30 years of age, in whom a diagnosis of spindle-cell sarcoma of the nasopharynx was made after microscopical examination of the tissue. The growth was removed by means of a curette, and for one month afterward the patient felt relieved.

Three months after the operation, the growth having recurred, Coley's serum was injected into the pectoral region. One-tenth of a minim was given at first and the dose increased three times a week until one month later when the patient was getting 1 ccm. with a reaction of 104°. After two months' rest, there having been no improvement, the serum was used daily, the first dose being 2 minims which was increased rapidly until the dose was 1.5 ccm. daily with marked reactions. About one and one-half months later the growth had disappeared.

OTTO M. ROTT.

Waldron, C. W.: **Roentgenology of the Accessory Nasal Sinuses with Special Reference to Sinusitis in Children.** *Intern. M. J.*, 1915, xxii, 1031.

The technique employed is that of Waters of Johns Hopkins Hospital whose description is quoted: "An important factor in making roentgenograms of the nasal sinuses is being exact in each individual case, and intimately associating oneself with the style of head with which one is dealing. . . . We have classified two distinct types, namely, the concave and the convex face; and there is a difference of an angle of only two degrees in the entire technique. . . . Only three points are essential in order to obtain roentgenograms of this region described: First, the chin should always touch the plate; second, the long axis of the tube should be parallel to the plate; third, the nose of the patient should be from 1 cm. to 1.5 cm. from the plate. Under this rule, the importance of knowing which style of head one is dealing with is obvious. For instance, in the convex-shaped face the nose is 1 cm. from the plate; whereas in the concave-shaped face the distance should be increased by about 0.5 cm."

It is explained that by this process, the shadows of the petrous portions of the temporal bones are projected beneath the floors of the maxillary sinuses, and the shadows of the posterior ethmoidal cells are shown below those of the anterior group. Also the possibility of confusing ethmoidal and frontal sinus disease is reduced by projecting the shadows of the anterior ethmoidal cells to a lower level, which this technique accomplishes.

The author believes that roentgenology is a necessary preliminary to diagnosis and treatment, especially as it might be the means of clearing up the etiology of asthma, chronic arthritis, and frequent slight elevations of temperature. OTTO M. ROTT.

O'Connell, G. A.: **Intranasal Obstructions.** *J. Ophth. & Oto-Laryngol.*, 1915, ix, 316.

The causes of intranasal obstruction are broadly divided into acquired and congenital. The most frequent and important obstructions are the septal and turbinal; the former may be cartilaginous or osseous deviations or both combined.

The author favors Talbot's theory, as to the cause of septal deviations. He considers that a neurosis or stigmata of degeneracy causes either an arrest or an overgrowth in the development of the bones of the face, including the nasal bones.

The various varieties of cartilaginous and long deflections are then enumerated, as also the enlargements of the structures on the lateral wall of the nose, especially in the region of the middle meatus. Other causes of nasal obstruction are mentioned, e.g., neoplasms, polypi, foreign bodies, the chronic granulomata.

Among the results of intranasal obstructions are: general lowering of vitality from insufficient oxygenation of blood; post-nasal dripping; feeling of fullness at root of nose; headache; predisposition to colds; asthenopia; sneezing; general irritability; tinnitus; ocular diseases and cranial affections from secondary involvement of sinuses. Reflex neuroses such as asthma, hyperæsthesia, neuralgia, etc., are mentioned. The treatment is surgical.

In closing, the author quotes the conclusions of Willis Sanderson on the effect of nasal obstruction artificially induced in dogs:

"1. Nasal obstruction leads to death or serious impairment of vitality.

"2. Lowered resistance predisposes to infection.

"3. Local disease of the respiratory tract is induced.

"4. It causes dilatation of the heart and changes in skin and blood.

"5. It causes symptoms of asthma and emphysema.

"6. Empysema of the lungs was demonstrated.

"7. Reopening of the nostrils was followed by disappearance of symptoms." OTTO M. ROTT.

THROAT

Gardiner, H.: **Tonsils and Chronic Cervical Adenitis.** *Lancet*, Lond., 1915, clxxxii, 752.

Repeated attacks of inflammation of the tonsils frequently cause these organs to become sclerosed

and "atrophic," and consequently less able to deal with organisms than when they are of normal size and can resist by hyperplasia.

Carmichael in 1909 found that a high percentage of tuberculous tonsils were atrophic, and that out of 30 cases of chronic cervical adenitis 7 showed the presence of the tubercle bacillus in the tonsils. Moreover, it seems likely that these small sclerosed tonsils may even be an increased source of danger, for they combine two dangerous conditions: (1) crypts with wider openings on the buccal surface than normal, and therefore presumably a facilitated entry for organisms; and (2) atrophy of the lymphatic tissue so that it is unable to deal with this invasion.

Investigation was carried out with the idea of determining what, if any, evidence there was bacteriologically of the infectivity of the tonsils in cases of chronic cervical adenitis in which there was no apparent and obvious source of infection. The method adopted was as follows:

1. In cases where the tonsils were enucleated they were transferred at once to a sterilized capsule or tin case. The capsule on the deep surface of the tonsil was then incised with all aseptic precautions, and a small portion of the deepest part of the tonsil was removed and inserted into the subcutaneous tissue of a guinea pig. A culture was also taken from the tonsil in this region and subsequently examined.

2. In cases (only a few) where the tonsil had not been completely enucleated, and where, therefore, it (never less than two-thirds of the whole gland) was liable to infection from without, this surface was lightly cauterized and the tonsil then dealt with as above. In this way not only was extraneous infection avoided, but the buccal surface of the tonsil was not touched.

On analyzing this group of 30 cases the following facts were shown: organisms of some sort were found in 24, or 80 per cent, of the cases. Of these organisms there were present the following:

Mycobacterium tuberculosis	in 7 cases or 29.2 per cent
Streptococcus	in 2 cases or 8.3 per cent
Proteus bacillus	in 7 cases or 29.2 per cent
Staphylococcus	in 7 cases or 29.2 per cent
Streptococcus pyogenes	in 2 cases or 8.3 per cent
Tubercle bacillus	in 4 cases or 16.7 per cent
Proteus bacillus	in 1 case or 4.2 per cent

The conclusions the author feels justified in drawing are as follows:

1. In the majority of cases (80 per cent) of chronic cervical adenitis where no obvious source of infection is present the tonsils are infected.

2. The size of the tonsils makes no difference as to their infectivity, except that the small fibrotic variety is likely to be more dangerous than the large.

3. The number of cases in which tubercle bacilli

are present is relatively small, but is larger than in simple cases of enlarged tonsils.

4. The frequent presence of other organisms than the tubercle bacillus in these cases suggests that a large proportion of the so-called chronic tuberculous glands are in reality chronic septic glands.

5. The organisms are present in the deepest parts of the gland, and are therefore only removed by operations involving complete enucleation.

D. C. BALFOUR.

Hudson-Makuen, G.: The Surgical Anatomy of the So-called Capsule of the Faucial Tonsil. *Laryngoscope*, 1915, xxv, 685.

The author draws attention to the following points:

1. The so-called capsule of the faucial tonsil is not a capsule at all in the strict sense of the term, and it consists in part at least of that portion of the intrapharyngeal aponeurosis in a recess of which the tonsil attaches itself in the course of its development.

2. The intrapharyngeal aponeurosis is a broad membrane having its attachment above the base of the skull, and extending downward it not only separates the tonsil and the palatal pillars from the superior constrictor muscle and other important tissues in the cervical region, but folds of this membrane protrude themselves between the tonsil and the pillars of the palate. The anterior fold when it protrudes itself well in front of and below the tonsil constitutes what is known as the plica triangularis or plica tonsillaris.

3. In the course of its development in embryo and during infancy, the tonsil appears to appropriate a portion of the connective and musculofibrous tissue with which it is in juxtaposition and finally in adult life it becomes firmly attached to this membrane to which has been given the name intrapharyngeal aponeurosis, a section of which seems to constitute the so-called capsule of the tonsil.

4. A complete extracapsular tonsillectomy, therefore, must leave a window resection of the intrapharyngeal aponeurosis, not only exposing the palatal pillars and the superior constrictor muscle but opening up avenues of infection in the deeper regions of the neck.

5. A more desirable operation which may be called an intracapsular tonsillectomy, or perhaps better still, an intercapsular tonsillectomy, is one in which the tonsil is removed with only the thin innermost layer of the capsule, the major portion of it being left in the pharynx as a complete lining of the fossa, where it serves as a strong wall of defense against infection in this region. This operation may be done easily and accurately with an ordinary snare in connection with the original Sluder instrument.

OTTO M. KORN.

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INTERNATIONAL ABSTRACT OF SURGERY

MARCH, 1916

COLLECTIVE REVIEW

UTERINE HÆMORRHAGE

BY PALMER FINDLEY, M.D., F.A.C.S., OMAHA

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HERETOFORE the causes of uterine hæmorrhage have been discussed, in great part, from an anatomic point of view. Emil Novak says that structural alterations in an organ are far easier to demonstrate than aberrations of function, and he finds uterine bleeding in the majority of cases to be the result of morbid anatomical changes. In this class of cases we have the neoplastic types, such as cancers and fibroids of the uterus, in which hæmorrhages occur in the absence of the menstrual flux.

A second class of cases is observed in which the lesion lies within the uterus or appendages, but the hæmorrhages are dependent upon the menstrual flux. In this group we find tubo-ovarian inflammations and ovarian tumors. These lesions might not in themselves cause uterine bleeding, but they can exaggerate the menstrual hyperæmia and result in hæmorrhages.

A third group referred to by Novak is that in which uterine hæmorrhages occur in the entire absence of any clearly demonstrable disease in the pelvic organs. In this class of cases the cause was first sought in the endometrium, but Novak believes with Hitschmann, Adler, and others that the endometrium has little influence in creating uterine bleeding.

The author does not deny that the myometrium as well as the endometrium may be responsible for a limited number of cases of uterine bleeding, but does not think the number considerable. Only an occasional influence in producing uterine bleeding is credited to arteriosclerosis.

THE SECRETIONS OF THE DUCTLESS GLANDS

Novak suggests that the cause of menstruation may be found to lie in the ductless glands which form a functional chain throughout the body. While the secretions of the ovary are all important to the process of menstruation, the other ductless glands, notably the hypophysis, suprarenal, and thyroid, may play an important contributory rôle. Furthermore, he argues that we must look to the vasomotor nervous system for important influences in producing uterine hæmorrhage. This is particularly true at the times of puberty and the menopause. It is impossible to determine to what extent the influence of the various internal secretions on menstruation is directly chemical and to what extent it is exerted through the medium of the vasomotor nervous system. The primary vasomotor center is located in the floor of the fourth ventricle and is definitely linked up with the psychic center, thereby explaining the occasional uterine hæmorrhage from severe emotional disturbances. Hæmorrhage of neurotic origin has been definitely proved by Brown-Sequard, von Recklinghausen, and others. Novak employs the term "angioneurotic" to such hæmorrhages.

R. Duffy finds bleeding from the uterus at the time of puberty is sometimes due to such pathological changes as abortion, polyps, and inflammation, but in the great majority of cases there is no evidence of uterine disease. These are the so-called "essential" or "functional hæmorrhages."

Duffy is of the opinion that the thyroid gland is an important factor in the causation of these hemorrhages and quotes Hertoghe of Antwerp, who says that the menses are normal when the thyroid is normally active and excessive when the thyroid secretion is deficient. "The weaker the thyroid the greater the loss of blood." Schri is also quoted in his report of 18 cases in which there was marked hypofunction of the thyroid. Duffy recommends both local and general treatment for the essential hemorrhages of puberty. Local treatment (curettage) is resorted to only when general measures have been tried without results. He affirms that the treatment of these cases is primarily medical. He prescribes calcium chloride in large doses—50 grains a day, blood serum (horse or human) 15 to 30 ccm. every other day, or thyroid extract or pituitary extract.

HEMORRHAGES OF PUBERTY AND THE MENOPAUSE

The greatest interest centers in the problem of uterine hemorrhages occurring at the two extremes of menstrual life; i.e., puberty and the menopause.

Lehmann very pertinently warns against the general use of the term "climacteric hemorrhage." Such a term can in no way define the cause of the hemorrhage and in its general adoption may well lead to the overlooking of cancer. The term at best can only signify the time of life in which the hemorrhages occur. In former years attempts were made to attribute all these hemorrhages to local lesions. Weil contends that they are due to functional disturbances of any and all the glands of internal secretion and recommends organotherapy to the exclusion of surgery. He finds the thyroid extract most efficient of all. For the control of serious hemorrhages he gives hypodermic injections of about 20 ccm. of human serum and believes it to be practically specific in its action.

Goffe, in writing of the significance of menorrhagia and metrorrhagia in the years of puberty and the menopause in which there is no demonstrable pathology to account for the bleeding, says that gynecologists have erred in concentrating their attention on the uterus and in neglecting the general condition of the patient. Repeated curettage of the uterus may fail to control the loss of blood. Muscular insufficiency, arteriosclerosis, or a diminished amount of calcium salts in the blood are occasional factors in causing uterine hemorrhage, but they are not constant factors.

Arnold Strundorf found one constant factor and that was that the menstrual blood failed to coagulate. The former teaching has been that fibrin caused coagulation. It is now known that fibrin is the product of fibrinogen and fibrin ferment, and that fibrin ferment is in turn the product of thrombogen and thrombokinas. There is also a substance in the blood called anti-ferment or antithrombin which prevents or inhibits coagulation and an undue proportion of this substance was found in the endometrium. The theory promulgated by Strundorf is that the corpus luteum controls the biologic factor in the endometrium. This theory was supported by the fact that cretinism was usually associated with amenorrhea. The activating factors are the ductless glands. In line with this hypothesis, Goffe recommends an initial curettage, and failing to control the bleeding by this procedure, he suggests the administration of ovarian extract or pituitrin.

The effect of corpus luteum secretion upon the coagulability of the menstrual blood has been a subject for investigation by Wintz and Fingerhut of Erlangen. A series of rabbits were castrated and compared with a series of rabbits which were not castrated. After castration the period of coagulability was prolonged, but returned to the normal upon the administration of corpus luteum.

Dalché reported two cases of menorrhagia in virgins in whom there were no pelvic lesions. He ascribed the hemorrhages to alterations in the internal secretions.

Lauth has conducted a series of animal experiments with ovarian extract and concludes that hemorrhage and hypertrophy of the uterus may be ascribed to hyper- or dysfunction of the ovary, especially as in most of the cases there were changes in the ovary in the nature of cystic degeneration. He introduces the term "ovarian metrorrhagia."

Halledey holds to the theory that uterine hemorrhages are due to correlative disturbances in the organs of internal secretion. Forty-one cases of uterine hemorrhage were successfully treated by Halledey with pituitary extract, and four cases with corpus luteum extract.

SYPHILIS OF THE UTERUS

Dalché emphasizes the importance of syphilis as a factor in uterine hemorrhage. Syphilis of the uterus is seldom considered, yet the author finds it not infrequently in the form of a diffuse syphiloma, as a gumma of the cervix, or as a sclerotic condition of the uterus and its blood-vessels.

Jaworski describes a syphilitic angiosclerosis of the uterus involving the whole organ and even the parametric tissue. In some instances the blood-vessels alone were involved in tertiary syphilis. Jaworski says that the hardening of the uterine blood-vessels and the loss of elasticity of the uterine tissues may give rise to frequent and copious hæmorrhages. Five cases are recorded by the author. Antisyphilitic treatment controlled the bleeding and in some instances the uterus became smaller and normal in consistency.

There are no characteristic symptoms of syphilis of the uterus. The most prominent symptom is hæmorrhage which resists all the usual forms of treatment, including curettage, but reacts favorably to antisyphilitic treatment.

ARTERIOSCLEROSIS OF THE UTERUS

Many contributions are presented to support the theory of arteriosclerosis of the uterus as a cause of uterine hæmorrhage.

Herman, Martin, Reinecke, Kuestner, von Kahlden, Popoff, Findley, and others have held that arteriosclerosis is a prime factor in uterine hæmorrhage.

Bukojemsky reported three cases of uncontrollable hæmorrhages from the uterus in which hysterectomy was performed. In all three cases typical arteriosclerosis was found and the severe hæmorrhages were ascribed to the changes in the walls of the blood-vessels. In one case there was necrosis of the vessel walls. Bukojemsky argues that arteriosclerosis of the uterus is an important etiological factor in uterine hæmorrhage. He differentiates between infectious metritis and sclerosis uteri, both being characterized by enlargement of the body of the uterus. In metritis there is an absence of periarterial processes. In sclerosis uteri there are periarterial processes and a diminution of elastic tissue in the uterus and blood-vessels. He believes the hæmorrhages are due to loss of elastic fibers in the vessel walls.

Jones finds the cause of climacteric hæmorrhages to be due to arteriosclerosis with secondary interstitial changes (fibrosis uteri). In these cases he found it impossible to check the hæmorrhages by means of the curette and was forced to resort to hysterectomy.

Hirsch does not believe that arteriosclerosis, endometritis, localized hæmophilia, or an abnormal state of the glands of internal secretion are factors in causing uterine hæmorrhages. He supports the views of Theilhaber that muscular insufficiency exists, and bases his treatment on this hypothesis. He injects from 0.25 to 1 gm.

of ergot into the cervix daily for three to four days, and has obtained excellent results.

Liepmann finds arteriosclerosis of the uterus to be the rule in old women and not uncommon at an earlier age. When occurring in the preclimacteric age it may account for severe uterine hæmorrhages.

Anspach applies the term "metrorrhagia myopathia" to a form of uterine hæmorrhage produced by morbid changes in the uterine musculature and independent of the usual causes of uterine hæmorrhage. These hæmorrhages usually arise at the close of the childbearing period in the form of an excessive menstrual flow or an intermenstrual flow. Anspach believes that these hæmorrhages can not be ascribed to arteriosclerosis, endometritis, or fibrosis uteri and finds that the elastic fibers in the uterine wall play a large part in the causation of preclimacteric hæmorrhages. The following excerpt is taken from *Progressive Medicine*, 1906, June, page 187.

"It is natural, then, at the close of menstrual life that the muscular elements having no further use should undergo atrophy and that the intravascular area of the organ should be diminished by sclerotic changes in the blood-vessel walls, and that this should be furthered, as it is in other organs, by an increase of elastic tissue or a failure in the normal obliterative changes of the vascular channels, or an excessive hypertrophy of connective tissue (making firm contraction of the uterus and compression of the blood-vessels more or less faulty) might result in disturbance of the endometrial circulation and produce profuse menorrhagia or metrorrhagia."

HYPERFUNCTION OF OVARIAN TISSUE

Frank asserts that advanced destructive processes in the ovary due to chronic inflammation are at times associated with hyperfunction of the remnants of normal ovarian tissue, and that this condition is responsible for the accompanying menorrhagias and metrorrhagias and for hyperplastic changes in the endometrium.

He finds menorrhagias and metrorrhagias in the absence of any anatomical basis and in the presence of a much thickened uterine wall. He says that the explanations offered by Theilhaber (connective tissue changes), by Findley (sclerosed vessels), and by Anspach (muscle and elastic tissue changes), "are not the sole ones because age changes, repeated childbirths, or continued ovarian hypersecretion may just as logically account for the connective tissue increase, the sclerosed vessels, the muscle changes, etc."

Frank does not attempt to explain the cause of hemorrhage in cases in which the uterus and ovaries are perfectly normal.

Liepmann states that hyperfunctions of the ovary may lead to great increase in the uterine musculature. Here the resulting hemorrhages are primarily of chemical origin, but secondary physiologic factors are also at work; i.e., muscular insufficiency. Hence it is not always possible to distinguish between causes which are chemical and those which are purely physiological.

ENDOMETRITIS

"Hemorrhagic endometritis" is a term that is destined to be discarded for the reason that irregular bleeding is not the result of an inflamed endometrium in the absence of mechanical causes such as polyps, fibroids, and cancer. Hirschmann and Adler will not admit of the possibility of hemorrhage from the uterus unless the ovaries are diseased, except when due to polyps, fibroids, cancer, and like mechanical conditions. They reaffirm their previously expressed opinion that there is no such lesion as hypertrophic or hyperplastic glandular endometritis. They opine that the hypertrophied glands are the normal changes of the premenstrual period. They do not believe that the increase in size and number of the glands of the endometrium can cause uterine bleeding. Furthermore, they do not believe that curettage will alter these glands inasmuch as a similar condition is regenerated from the glands not removed by the curette. They further affirm that interstitial inflammation of the mucosa does not lead to hemorrhage, that the hemorrhage is due to inflammation of the ovaries. Changes in the functions of the ovaries in the presence of retroflexion, metritis, and myoma are said to be responsible for the hemorrhages. All causes for hemorrhages are excluded from consideration with the exception of submucous tumors, polyps, and mechanical irritations. The authors conclude that curettage is no more than symptomatic treatment.

Liepmann endorses the views of Hirschmann and Adler that endometritis causes leucorrhœal discharges, but not hemorrhage. An exception is made to this statement in reference to polypoid endometritis.

Wagner finds that the curette controlled the hemorrhage in only ten per cent of 600 cases of uterine bleeding. He does not believe that endometritis can account for uterine hemorrhages. He lays great stress on the ovarian origin of uterine hemorrhages and finds great satisfaction in organotherapy and radiotherapy.

NON-COAGULABILITY OF THE MENSTRUAL BLOOD

Bell has made chemical analyses of the menstrual blood obtained from ten cases of hematocolpos due to atresia. These observations were made for the purpose of determining the factors responsible for the non-coagulability of the menstrual blood. He found that blood constituted less than fifty per cent of the total volume of retained fluid; that mucin from the cervix and vagina exceeded in bulk that of the blood. The calcium content was six or more times that of normal blood and there was a total absence of urea, fibrin-ferment, and fibrinogen. The author is of the opinion that the lack of coagulability of the blood was due to the absence of fibrin-ferment and fibrinogen.

Dicost, on the other hand, finds the fibrinogen content of menstrual blood to be equal to that of normal blood, and fibrin-ferment in less quantity than in normal blood. It is his opinion that there is an antithrombin in the endometrium which neutralizes the thrombin in the blood as it passes from the blood-vessels of the endometrium. By certain physicochemical tests he has isolated an antithrombin in the endometrium and observes that this antithrombin is found in very large quantities in the hypertrophied endometrium associated with bleeding fibroids. In further support of his argument he observes the same condition in uterine polyps and an absence of antithrombin in the recently delivered uterus.

Whitehouse says that every case of uterine hemorrhage demands first of all a general examination before local conditions are investigated. Faults in calcium metabolism may account for obscure uterine bleeding. In these cases a cure may be effected by the administration of calcium salts with which thyroid tissue may be combined. Hemorrhages at the time of the menopause may be due to increased arterial tension, portal obstruction, or fibrosis uteri, secondary to arteriosclerosis. In these cases ergot usually fails. The empirical administration of hemostatic drugs is frequently useless and curettage may be harmful.

Adler emphasizes the need of an accurate diagnosis of the cause of uterine hemorrhage for the purpose of deciding upon treatment. For the purpose of diagnosis he lays more stress upon an accurate history than upon the physical findings, especially in ectopic pregnancy. He says that endometritis (glandular and interstitial) does not alone cause uterine hemorrhage in the absence of lesions of the adnexæ, especially of the ovary, or retrodeviations of the uterus. He finds irregularities of the menses in adnexitis only when the

ovary is involved to the extent of causing functional disturbances of the ovaries.

Polyps, hyperplasia of the uterine mucosa, and atony of the uterine musculature may favor hæmorrhage, while altered secretions of the ovary account for uterine bleeding in myxedema, Addison's disease, Basedow's disease, and chlorosis. Sedentary life, corsets, constipation, and masturbation produce excessive menses through active hyperæmia of the pelvic organs. General and circulatory diseases and psychic disorders may lead to excessive bleeding from the uterus.

TREATMENT OF UTERINE HÆMORRHAGE BY DRUGS

Focke has administered digitalis in the past fourteen years in one hundred cases of uterine hæmorrhage and succeeded in controlling the bleeding in fifty per cent of cases. He groups the cases as follows:

1. Hæmorrhage from organic disease of the uterus—tumors, gonorrhœa, etc.—without pregnancy.
2. Hæmorrhage in pregnancy and in threatened abortion.
3. Hæmorrhages in the absence of pregnancy and organic lesions—idiopathic or essential hæmorrhages.

In the first group no results were obtained from the use of digitalis. In the second group the results were not encouraging. In the third group the results were good. The good results were credited to the effect of digitalis upon the circulation in relieving pelvic congestion.

Arthur H. Curtis comments upon the tendency of surgeons to overlook the possibilities of blood therapy. He reports two cases of uterine hæmorrhage which were successfully treated by injecting whole blood. The method employed is commendable for its simplicity and is worthy of extended trial. His technique is as follows:

"A 20-ccm. or larger ground-glass syringe is sterilized, preferably by the dry method, and the inner surface lubricated with sterile petrolatum. Blood is withdrawn in the usual manner from a cubital vein of the donor; the needle is then inserted beneath the subcutaneous tissues of the back of the patient and the blood injected." In two cases reported by Curtis the injections were repeated once in the first case and five times in the second, at intervals of 48 hours. In the second case the hæmorrhages recurred one year later and were permanently checked by a repetition of the treatment. Curtis believes that the injection of whole blood in many cases of uterine hæmorrhage will obviate the necessity of operative

interference or expensive and time-consuming roentgen-ray treatment.

Thwaits injected human serum from the mother into a girl, 15 years of age. The girl had not been free from uterine bleeding longer than eight days at a time for six months. No pelvic abnormalities were noted. Uterine drugs had failed to give relief. A subcutaneous injection of 10 ccm. was given and immediate improvement was obtained. Menstruation returned in twelve days and lasted eight days. A second injection of 30 ccm. of the mother's serum was given and permanent results followed.

Kaiser injected 20 ccm. of horse serum in each of two cases of excessive menorrhagia which had resisted all other measures. The results were immediate and perfect.

Landsberg gave subcutaneous injections of a one per cent solution of calcium lactate in inflammatory processes. He injected 10 ccm. and repeated the dose every two or three days. The results do not seem to be remarkable.

Powdered sugar is recommended by Berczeller for the control of offensive discharges and hæmorrhages in cancer of the cervix. A cylindrical speculum is inserted, the cervix dried with gauze, and the speculum half filled with powdered sugar. A strip of iodoform gauze is inserted and the speculum removed. These treatments are repeated one or more times a week.

Prof. Fromme of Berlin is carrying on a series of observations on the intravenous injections of enzytol for relief from essential hæmorrhages. He claims that the drug causes follicular atrophy of the ovary as do the roentgen rays. He uses a 10 per cent solution of enzytol in normal salt solution, beginning with 2 ccm. of enzytol in 20 ccm. of normal salt solution and increasing the enzytol 1 ccm. each three days for twelve injections, the injections being given twice weekly. Up to July 1 he had treated 61 cases. A few of these cases were not influenced by the treatment. Occasionally the hæmorrhages were increased for a month or two and then decreased. Not all cases became amenorrhœic, but with few exceptions the menstrual flow decreased to the normal or ceased altogether. If no effect was manifest after twelve injections operation was advised. If the hæmorrhages were checked for a time and recurred the treatments were repeated. Prof. Fromme regards the drug as in the experimental stage.

Gerstenberg recommends the application of pure formalin to the endometrium for the control of climacteric hæmorrhages. The formalin is applied by means of a swab. Gerstenberg says

that if two such applications do not check the hemorrhages, his suspicions are aroused that cancer, fibroids, or some other lesion is present.

ORGANOTHERAPY IN UTERINE HEMORRHAGE

Ilab treated 145 cases of uterine hemorrhage with pituitrin. These cases embraced a series of pathological conditions, i. e., myoma, ovarian cysts, inflammation of the adnexa, climacteric, and leucic hemorrhages, and hemorrhages of ovarian and thyrogenic origin. He reports complete cure in 84.2 per cent.

Jayle has injected hypophyseal extract in such affections as metritis and subinvolution with metrorrhagia and uterine sclerosis of the menopause with hemorrhage. The immediate results were good.

Pituitary extract was tried in the Rothschild Hospital of Wien for uterine hemorrhages of every variety and was found worthless in all cases except in the hemorrhages of puberty. At puberty the hemorrhages were not only controlled, but the menses were regulated in time. Daily subcutaneous injections were given of 1 ccm. of pituitrin for fifteen to twenty days. The bleeding was usually controlled after the second or third dose, and the general condition of the patient improved rapidly.

Hofstatter employed hypophyseal extract in twelve cases of severe menstrual bleeding with irregularity during puberty. Nine of the cases were cured in a short period of time.

Koch recommends the hypodermic injection of ergot or pituitrin into the cervix to control hemorrhages associated with relaxation and congestion of the uterus. These injections are made into the anterior lip of the cervix in doses of 1 to 20 ccm. Ergot gives a more permanent effect than does pituitrin, but from the fact that ergot often produces toxic symptoms the author favors the use of pituitrin. A second injection may be required at the end of twelve to twenty-four hours. The author ascribes the action of the drug to its effect upon the cervical sympathetic ganglion which lies close to the posterior cervical, the fibers of which ramify through the cervix.

Halledev in writing of the etiology and organotherapy of uterine hemorrhage recommends the hypodermic injection of pituitrin. In this manner the hemorrhages were controlled in forty-one cases. In five additional cases hemorrhages were relieved by the administration of corpus luteum extract.

CURETTAGE

Adler would restrict curettage to the removal of placental remnants, polyta, hyperplastic endo-

metrium, and for diagnosis in suspected malignancy. In gonorrhoeal endometritis the curette is useless and may be harmful. In fibroids of the uterus the author believes the curette is dangerous and finds that the hemorrhages of puberty are not controlled by the curette. He recommends the administration of 1 ccm. of pituitrin subcutaneously for five days, also the administration of mamin for three to four months every year. Where coagulation is defective calcium is recommended. He would avoid serum on account of anaphylaxis. As a last resort the vagina should be tamponed. The X-rays should be used in selected cases only and when used the course should be closely observed by a gynecologist. Radium should not be used in the presence of benign tumors.

CONTROL OF HEMORRHAGE IN INOPERABLE CANCER OF CERVIX

Curettage, followed by vigorous application of the Paquelin cautery, continues to hold its place as a valued means of checking hemorrhages from a cancerous cervix. Blau recorded his results in 408 cases in which there was an average of 252 days of life after the initial treatment, while Pawlick records a case living twenty-one years after the initial curettage and cauterization. Aguin Tower has reported 110 cases treated by the Paquelin cautery which were apparently healed after five years.

The Gellhorn treatment for inoperable cancer of the cervix is only rivaled by radium. The method of Gellhorn consists in scraping away all friable tissue, then elevating the lips of the patient and introducing about one ounce of acetone into the vault of the vagina through a Ferguson speculum. Before introducing the acetone it is well to thoroughly smear the vaginal walls and vulvar surfaces with sterile vaseline. The excochleated area is exposed to the acetone for twenty to thirty minutes and is then decanted. The cancer crater is then packed with a strip of sterile gauze wrung out in acetone and in advance of the gauze is placed a sterile dry tampon. The treatments are repeated every two or three weeks and later at longer intervals. No anæsthetic is required subsequent to the initial treatment. If these treatments are faithfully and intelligently carried out, the hemorrhages will not recur and the leucorrhœal discharges will almost, if not wholly, disappear.

RADIOTHERAPY IN MYOMATA AND IDIOPATHIC HEMORRHAGES

Aside from the cancer problem there is no more absorbing question in gynecology than that of

the treatment of myomata and idiopathic hæmorrhages by the means of the X-rays, radium, and mesothorium. Following the lead of Germany and France, the United States has become increasingly interested in these treatments. However, it cannot be said that the profession in the United States is prepared to go all the way with such enthusiasts as Kroenig and Gauss of Freiburg.

According to Weber, this form of therapy is more applicable to climacteric hæmorrhages than to myomata. He finds that the younger the individual, the slower the reaction, because of the greater vitality of the ovaries. He does not find the nervous phenomena incident to the induced menopause to be a serious embarrassment; in nearly every instance they have been absent or insignificant.

Pfahler finds that uterine hæmorrhages from fibroids of the uterus are controlled in practically every case by giving large doses along the lines laid down by Gauss; that with smaller doses the hæmorrhage returns in only three or four per cent of the cases. He has had almost universal success in the control of hæmorrhage of the menopause, not due to malignancy. The response to such treatment in these cases is usually very prompt.

It is of interest to note that in the experience of Symer and Menge the X-rays do not have an unfavorable effect upon inflammatory adnexal disease accompanied by uterine hæmorrhage. In no case did they see a lighting up of the latent inflammatory process. Not only were the hæmorrhages controlled, but pain and leucorrhœal discharges ceased in all cases.

The X-rays are especially adapted to the treatment of myomata and myopathic hæmorrhages in women of advanced years who are anæmic or who suffer from diabetes, nephritis, thyroid disease, pulmonary disorders, or organic heart lesions. In young women a finer distinction is imperative because of the likelihood of inducing early menopause.

McGlenn discusses the question of elimination of surgery in the treatment of fibroid tumors of the uterus and concedes that roentgenotherapy has an important place in the treatment of myomata, but finds no justification for the view that surgery should be entirely supplanted. He finds complete cure in only 5.3 per cent of the 796 cases of Mohr that were treated by the X-rays. By "complete cure," McGlenn includes only those cases in which all symptoms were relieved and the tumor completely absorbed. Fibroids treated by surgery are limited only by the general condition of the patient while the

X-rays are limited by the condition of the tumor. Women with fibroid tumors may be poor surgical risks on account of anæmia, or associated heart, kidney, pulmonary, or other pathological conditions. These are the cases best adapted for roentgenotherapy. In such cases a cure may not be effected but dangerous symptoms are relieved. Future developments may endanger these patients, but chances are taken because of the danger of operating under these conditions. Where anæmia is grave the X-rays will check the hæmorrhages and prepare the patient for future operation.

An enormous amount of literature has accumulated on the treatment of fibroids of the uterus by the roentgen rays. In the *Jahresbericht fuer Geburtshuelle und Gynaekologie*, 1913, 948 cases are referred to in which the X-rays have afforded excellent results in controlling hæmorrhage and in reducing the size of the tumors. Among the authors of these case reports are Gauss, Haendly, Haenisch, Jung, Kelen, Nemenow, Runge, Schmidt, and Strassman. On the other hand less favorable reports are presented by Abel, Mackenrodt, Veit, and Weber.

Mackenrodt observed a tumor to shrink in size without controlling the hæmorrhage. Zollner records six cases, in all of which the hæmorrhages were temporarily checked, but in five of the six cases the hæmorrhages recurred. The metrorrhagias and preclimacteric hæmorrhages were most favorably influenced by the X-rays in the experiences of de Bovis, Bumm, Grafenburg, Haendly, Kelen, Rosenfeld, Runge, Siredey, and Weber.

Cases are reported in which the hæmorrhages persisted or were increased in severity, thereby necessitating operative intervention. Peham reported two fatal cases, the deaths ensuing from hæmorrhage following the application of the X-rays. Futh observed two fibroids grow under the influence of the X-rays and the hæmorrhages persist without alteration. Schmidt reported nineteen cases and of this number two showed a marked increase in the hæmorrhages under the influence of the roentgen rays. A similar case was reported by Weber.

Among the many authors who have taken a conservative stand in the roentgenotherapy of myomata is Flatau, who finds that the hæmorrhages may be controlled in the presence of an overlooked malignant degeneration. The rule that is generally adopted to first curette the uterus for the purpose of excluding possible malignancy is not an absolute safeguard. While few cases of carcinomatous degeneration will be overlooked

in such a procedure, there will be a greater chance of overlooking sarcomatous degenerations.

The nervous phenomena following the application of the X-rays are to be reckoned with, but they are not so pronounced as following the removal of the ovaries. The explanation probably lies in the fact that the ovarian activity is not wholly annulled by the rays, at least for a considerable time, thereby maintaining a balance between the ductless glands.

Schöenberg finds that unfavorable results reported in the treatment of fibroids by irradiation show that only a small percentage can be classified as complete cures. The majority of cures were only symptomatic. The danger of late appearing lesions must be borne in mind.

Runge expresses the fear of injuring the parenchyma of the ovary in young women, thereby producing defective ova which if impregnated might result in giving rise to monstrosities and imperfectly developed individuals.

Frank has had good results in the X-ray treatment of menorrhagias of puberty and the climacteric. At puberty considerable doses were given at intervals to allow an occasional menstruation to occur. The treatment was discontinued when the menstruation became scant and infrequent.

Kupferberg believes that the X-rays should be preferred to all other forms of treatment in myopathias because, "it is absolutely without danger and does not produce the unpleasant by-effects of operation." He does not favor the general use of the X-rays in myomata, excluding those that are submucous, pedunculated, subserous, and those that are undergoing malignant degeneration or are accompanied by an ichorous discharge.

Kroenig, in summing up the indications for roentgen treatment of myomata of the uterus, says that the X-rays are indicated in all fibroids occurring after forty years of age; that in these cases irradiation is preferable to surgery because it causes no deaths and can be used safely in cases weakened from loss of blood and suffering from weakened hearts. He recognizes the disadvantages of greater expense and longer time in treatment. In younger women he prefers operation. He mentions the fact that the uncertainty of diagnosis is an embarrassment to the use of the X-rays. Reference is also made to ovarian cysts, carcinoma, sarcoma, etc.

Weitzel says that if a wrong diagnosis can be avoided, if patients with irregular hemorrhages are subjected to a diagnostic curettage before the beginning of X-ray treatment, and if the patients

are continuously kept under careful supervision during the treatment, then a complete cure, in a clinical sense, may be obtained by the X-ray treatment in cases of myomata and hemorrhagic myopathia without danger to the patient.

Mueller recommends that two or three irradiations be given after the hemorrhages have ceased in myomata and fibrosis uteri. His opinion is based upon observations in a case in which the bleeding recurred in six months and an operation was performed at the request of the patient. The cause of the recurrent bleeding was found to be the remains of functioning ovarian tissue.

It has been frequently observed that the first series of exposures are liable to result in an increase in the hemorrhages, hence the advice of Pfahler to enjoin rest after the first series of applications of the X-rays in treating very anæmic patients. Pfahler makes three to nine applications on successive days to be followed by a period of rest for one month before repeating the series. If the hemorrhages are not controlled by the completion of three series the treatments are abandoned.

Stern rarely failed in controlling the hemorrhages but found great variation in his results as to the number of applications required.

Mohr applied the X-rays in 354 cases of myopathic hemorrhages and obtained desired relief in 46.8 per cent and improvement in 11.8 per cent. In six of these cases there were severe hemorrhages at the beginning of the treatment and later complete relief. Clark, in commenting upon the statistics of Mohr, says that it is surprising to note that the percentage, both of cures and improvements, in the myopathia cases, i.e., those suffering from uterine hemorrhages of indeterminate origin, is distinctly lower than in the myoma cases, since it is particularly in the former field that X-ray therapy is generally believed to find its most important application.

Loose recommends the application of the X-rays to the ovaries in the essential hemorrhages of virgins.

Langes treated thirty-nine cases of myopathic hemorrhage from the uterus with the X-ray, with the result that six cases remained unchanged and one aggravated. With improved technique he has had no failures.

Pfahler records the advantages and disadvantages of the X-ray in the treatment of uterine fibroids as follows:

The advantages are:

1. It is painless.
2. It avoids the shock of an operation.
3. It preserves to a certain extent, we believe,

the internal secretion which is lost in a complete oophorectomy.

4. It does not interrupt the usual habits.
5. Confinement in a hospital is avoided.
6. In the hands of a skillful operator, it is without risk.
7. The menopause is brought on gradually, when necessary.
8. The amount of treatment can be graded to the needs of the patient.

The disadvantages are:

1. The prolonged course of the treatment that is usually necessary.
2. There is danger to the overlying tissues if the rays are not properly applied.
3. It has been claimed to be more expensive than operation.

Gustav Zinke expresses the opinion that, "the administration of the roentgen rays is limited to those cases in which extirpation of the tumor, or of the uterus, is inadvisable and relief from hæmorrhage or other symptoms alone is sought." This view is shared by a host of clinicians in England and America.

EFFECT OF X-RAYS ON THE OVARIES

Lacassagne has published a thesis on the effect of the X-rays upon the ovaries, which throws light upon the effect of the rays upon uterine fibroids and upon the question of sterility following upon the application of the rays to the ovaries.

Degenerative changes were observed to take place in the ovaries a few hours after irradiation and these changes were completed within fifteen days with disappearance of the follicles. However, sterilization was rarely complete because primary follicles remained. Regression of the interstitial glands was in evidence from the second to the third month, but by the fifth month there were evidences of new interstitial glands. New follicles began to grow by the sixth month in many instances. The sexual life of the animals was shortened and some of the animals were permanently sterilized. It was found that to insure permanent sterilization the irradiation must be so strong as to risk the life of the animal. The conclusions drawn are that it is impossible to sterilize a woman by the X-rays, and that the effects on the fibroid are due to the destruction of corpora lutea and to direct action on the fibroid.

Shoenberg believes the reduction in size of myomata to be primarily due to ovarian sclerosis. Calatayud says the blood supply to the tumor and uterus is lessened as a result of loss of ovarian function. Regand and Lacassagne conducted a

series of experiments on rabbits and concluded that the radiosensibility begins with the growth of the follicles and attains its maximum with full follicular maturity. With the development of the corpus luteum radiosensibility decreases markedly, and no alterations are observed in old follicles.

ROENTGEN TECHNIQUE OF DEEP THERAPY

Holden gives the following résumé of the Gauss technique: (1) The use of hard tubes—Walter 6 to 8, Wehnelt, 9 to 10; (2) the use of a filter of aluminum; (3) the use of a circuit breaker in the primary current so that 100 to 120 impulses per minute may be delivered to the tube; (4) the division of the skin over the site of the disease into small areas 2 cm. square and the treating of each area separately and only once in a series; (5) the administration on each area of skin 15 X or one and one-half times the erythema dose; (6) a "cross-firing" of the rays so that the rays directed at different angles through different areas of skin converge at the site of the disease; (7) the directing of the rays toward the site of the disease from every angle from the front, back, sides, above, and below; and (8) the administration of the treatments in series. A series consists of 300 to 550 X administered on one or two days. This is followed by an interval of about 18 to 22 days, at the end of which time another series is administered. In myoma cases five to six series are commonly used. The bleeding is controlled within one month after the treatment is begun.

Holden suggests that the duration of the treatment can be shortened by increasing the area of exposure. He further notes that the enormous dosage given by Gauss is liable to dangerously stimulate the treatment by men who do not measure their dosage of the X-ray.

RADIUM AND MESOTHORIUM TREATMENT OF CANCER OF THE CERVIX

Whatever doubts may exist in the minds of the profession respecting the curative effects of radium, mesothorium, and roentgen rays in cancer of the cervix, all will agree that in the control of hæmorrhage these agencies, rightly applied, can not be too highly extolled. Their application should be confined to inoperable and recurrent cases. In such cases the progress of the disease may be stayed, the hæmorrhages controlled, pain and offensive discharges relieved.

A report of the London Radium Institute in 1914, has the following to say of carcinoma of the uterus:

"Uterine cancer continues to yield most gratifying results, and the effects of radium treatment

in operable cases are far in advance of those obtained by any other known medical or surgical methods. The local manifestations of the disease are benefited in the most striking fashion, and the complete disappearance of fungating growth, arrest of hemorrhage and discharge, healing of ulceration, and relief from pain are phenomena of frequent occurrence. In favorable cases, moreover, the treatment appears to exert a distinctly retarding influence on the dissemination of deposits, and thus to arrest the progress of the disease. It is not possible, however, to speak of cure even in these latter instances.

"The routine treatment consists of thirty hours' exposure five days, six hours a day, to a 100-mg. tube screened with 2 mm. of lead and 3 mm. of rubber applied per vaginam, supplemented by a plate of 70 to 100 mg. activity screened in similar fashion and applied over the pubes. In this way a powerful and effective cross-fire irradiation of the affected parts is obtained.

"Small isolated nodules in the vaginal walls, recurrent after hysterectomy and inoperable, respond very well to treatment with large doses heavily screened, and not infrequently cease to grow, contract, and become replaced by fibrous tissue.

"Great care must be exercised in the treatment of recurrences which make their appearance within six months of the performance of a Wertheim operation. The functions of the trophic nerves seem often to be impaired seriously by the extensive and elaborate dissection which is associated with this method of hysterectomy, and for this reason the amount of radium used should be small, not exceeding 50 mg., the screening not less than twenty-four hours spread over four or five days. Unless these precautions be observed a severe and extensive destructive reaction may follow the application of radium. In all cases in which radium is applied within the vagina, the patient should be instructed to douche freely night and morning for at least six weeks after the termination of the treatment, as unless this be done an adhesive vaginitis not infrequently occurs. In some extremely susceptible subjects a transient proctitis has been noted to follow upon intravaginal treatment."

Summ and Voigt give alternating treatments with mesothorium (150 to 300 mg. for 10 to 12 hours) and X-rays (sitting for one hour on alternating days). With this treatment there were apparent cures in 13 cases of cancer of the cervix. These treatments extended over a period of 19 to 84 days.

Doederlein writes of having given several applications of mesothorium (50 to 170 mg.) for twenty-four to forty-eight hours at a time to a patient who was so weakened from loss of blood that death was expected momentarily. The hemorrhages were entirely controlled and at the end of two months she returned to her home, and at the end of four months from the date of the first irradiation she was apparently in perfect health.

The general tendency of workers in the field of radiotherapy is toward an increase in dosage. Schauta started with 10 to 25 mg. of radium and is now using as much as 100 mg. for a period of eight days. He says, however, that such intensive doses are not always well borne, and he prefers, for the average case, 40 to 50 mg. applied for five days at a time for three applications. Such heroic treatments are not required for relief from hemorrhages.

Schauta, in a later communication, records a revision of his technique. He now gives 5 to 8 exposures of twelve hours each at intervals of one to several days. Then follows an interval of one or three weeks when a second series of shorter duration is given.

Degrais and Bellot have not failed to relieve hemorrhages from cancer of the uterus by radium even in far advanced cases.

Kassogledoff does not believe irradiations are suitable for advanced cases of cancer of the cervix because of the danger of septic necrosis and septicemia. He recommends the combination of radium and roentgen rays. When the treatments are sufficiently intense, marked improvement is obtained and in some cases there is clinical recovery with disappearance of all symptoms.

RADIUM TREATMENT OF MYOMATA

Robert Abbe gives unqualified endorsement of radium in the treatment of uterine fibroids causing hemorrhage. He says: "It is a pleasure to add an agent so simple and powerful as radium for the control of this serious malady. But best of all is the demonstrated greater effect of its reducing power and frequent cure of the tumor itself. It is quite possible that when the exact dosage of radium and its best method of application can be certified, it will be found to be a uniformly curative agent for fibroid tumors."

Abbe refers to radium treatment as a boon where the patient is suffering from grave anemia. According to the author it is the γ -rays that are the deep penetrating force, but these rays do not in themselves effect the repression of the tumor

cells. This is effected solely by the β -rays, which are generated in the tissues through the impact of γ -rays with the tissues through which they pass. Abbe credits the β -rays with an intense local effect upon the bleeding endometrium. This effect is the creation of a vascular blockade lymph infiltration, and cell retrogradation, followed by restoration to healthy condition. Abbe inserts into the cavity of the uterus a smooth, long glass radium tube containing 50 mg. radium element. This tube is removed at the end of two and a half hours. Four days later a second tube of 100 mg. is inserted for a period of two hours. With added experience he finds increased confidence in the use of large doses and less frequent application. He thinks it wiser to effect slow reduction of the tumor where it is desired to preserve the child-bearing function. Radium, says Abbe, is the procedure of choice in all cases except pedunculated fibroids.

Nahmacher finds better results in the use of radium in myomata and myopathias than in the X-rays. In the first four years he had irradiated 14 myomata, two of which extended to the umbilicus. In 10 cases amenorrhœa was induced and in two cases oligomenorrhœa. Two of the myomata were very large and were subsequently removed. The control of bleeding and the decrease in the size of the tumors were more rapidly accomplished by radium than would have been possible by the application of the X-rays.

Howard Kelly, in a report of the treatment of thirty-six cases of fibroid tumors with radium, found the indications for treatment "in a surprising number of cases," to be hæmorrhage, either menstrual or intermenstrual. Thirty-five of the thirty-six cases showed marked reduction in the size of the tumor within two to eighteen months. Kelly affirms that in all cases the radium can be depended upon to bring about complete amenorrhœa. In the one case of the series, in which the tumor was not reduced in size, complete amenorrhœa was secured. In four instances the patients were young and to avoid bringing about complete amenorrhœa smaller doses were given.

Kelly finds the ideal dose to be 0.5 gram inserted into the cavity of the uterus for two hours. The effect upon the menstrual functions will depend upon the amount of radium, the size of the tumor, the position of the ovaries, and the time of exposure to a given amount of radium.

The discomforts of the procedure have been reduced by giving large doses for a brief period. Where small doses are given over a long period (25 mg. for 16 hours) the discomfort may persist for several weeks.

Kelly believes that with increased experience and improved technique, radium will be made to control all hæmorrhages due to fibroids of the uterus and in most instances (9 out of 10) it will obliterate tumors. Where patients are too weak and anæmic for dilatation of the cervix, they may be treated exclusively through the abdomen.

Kelly and Burnham believe that the roentgen rays and radium act directly upon the fibroid tumor by producing endo-arteritis, thereby diminishing the blood supply of the tumor by way of the nutrient blood-vessels. They argue that the general opinion entertained that these agencies operate upon the tumor indirectly by producing follicular atrophy of the ovaries is questionable, for the reason that many fibroids grow after the menopause and after the removal of both ovaries and that tumors show regression in size when treated after the menopause. Furthermore, fibroid tumors have been observed to decrease in size without lessening the menstrual flow. Kelly and Burnham conclude that there is a specific and direct action of the rays on the tumor itself. The authors affirm that radium has the advantage over the X-rays in being more simple in application, more rapid in its effects, and in acting with greater intensity upon the uterus than upon the ovaries, thereby offering the possibility of doing away with the fibroid without destroying the function of the ovaries.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Furniss, H. D.: Some Observations upon Post-operative Ureteral Fistulae. *Am. J. Obst.*, N. Y., 1915, lxxii, 837.

The author believes that the greatest number of ligated and severed ureters occur in hysterectomies for uterine fibroids. Since extensive operation for carcinoma has come into more general use there has been an increase in the number of ureterovaginal fistulae. In this operation the injury is more often due to temporary clamping of the ureter which is later followed by necrosis and sloughing. Sampson has stated that prolonged tying of the ureter is less dangerous than temporary clamping, and this statement has been proved by clinical experiments.

Most fistulae result from necrosis of the ureter, due to too rough handling, too extensive dissection, or to temporary clamping. In all of these ureteral fistulae, there is a marked inflammatory infiltration around the end of the ureter, and this is to be remembered in operating. In the beginning it is so great that the repair of the abdominal fistula by another anastomosis has little chance of success.

In the incomplete variety, especially when only

a small spot on the ureteral wall has been injured, there is not so great a likelihood of the ureter becoming obstructed and for this reason the function of the kidney is not impaired. The majority of these close spontaneously. After the lapse of four months with no improvement there is little hope of the fistula closing of itself.

In the complete type, narrowing of the tract occurs, with consequent obstruction to the urinary flow. This causes back pressure with consequent dilatation of the renal pelvis and the calices, and pressure atrophy of the renal parenchyma. Usually there is added infection which hastens the destruction of the kidney function.

The proper care of ureteral fistulae depends upon a knowledge of the natural history, a careful study of all the conditions, and selection of the treatment that will give good results. The author believes that we risk too much in saving kidneys that are of no functional value. It is useless and unwise to attempt ureterovesical anastomosis in cases where there is serious renal damage. The operation is attended with more risk than nephrectomy and, should success follow, the drainage into the bladder from an infected kidney is of itself harmful.

C. H. DAVIS.

SURGERY OF THE HEAD AND NECK

HEAD

Miers, E. M.: Common Head Injuries. *Am. J. Surg.*, 1915, xxix, 399.

Emphasis is put upon the importance of early diagnosis in cases of head injuries. Miers believes when the pressure is sufficient to cause an anemia of the brain-cells, lasting for twelve minutes or more, the cells will not regenerate; and when brain tissue is torn or diseased it never heals. Skull fractures, regardless of their innocent appearances, should be carefully watched, especially those of the puncture variety. Mortality of fractures at the base is extremely high. Diagnosis of fracture of the vault may offer difficulty, and must be sought in the symptoms, especially of intracranial or extracranial bleeding, either free or into the tissues.

Concussion, contusion, and compression are

so closely related that it is hard to say where one begins and the other ends. Blood-pressure often gives a direct clue to cranial injuries.

Treatment must be very prompt if at all. In case of hemorrhage from the middle meningeal artery, a ligation of the external carotid may be quickly performed. The treatment of the vault means the correction of the cerebral complications. In fracture of the base the reverse holds true. Here rest, quietude, and ice-caps are advisable with sedatives for great restlessness; free movements of the bowels with salines; nose and ears to be swabbed out with antiseptic, not washed and plugged with sterile cotton. In compression the cause should be removed. He believes lumbar puncture for the relief of pressure is dangerous. Venesection should be resorted to in order to lower blood-pressure and delete the brain.

E. C. ROBITSHKE.

Mackee, G. M., and Remer, J.: *The X-Ray Treatment of Ringworm of the Scalp.* *Med. Rec.*, 1915, lxxviii, 417.

The authors present an elaborate and well-illustrated article on the roentgen treatment of ringworm of the scalp. They point out that the older methods of treatment are inefficient, and that while in European clinics the method of X-ray treatment has become general since it was introduced by Sabouraud and Noire in 1904, yet it is only within the past few years that American radiologists have entered this field. Even now there are comparatively few such clinics in America; and even in many of them the treatment of ringworm is unsatisfactory because the technique has not been modernized.

In general there are two methods of employing the X-ray in this disease, viz., the divided dose and the massive or intensive dose. In general, the latter method is that employed in Europe, but in this country it is employed to a limited extent only; the unscientific—divided dose—method being more generally used. The objections to this method are that it precludes accurate direct measurement and cannot be employed to produce a defluvium of the whole scalp, at least not without danger to the patient. Its use in united areas is objectionable, in that loosened diseased hairs are scattered over the scalp, producing fresh areas of disease.

The basis of X-ray treatment in tinea tonsurans is its ability to cause a defluvium—to make the hair fall out. The X-ray does not have a destructive effect on the fungus though it may perhaps modify the soil on which it grows. The spores are removed with the hair, any that remain being destroyed by antiparasitic remedies while the hair is regrowing, which usually is effected within three months.

The authors give a detailed description of the technique followed at Fordyce's clinic in New York, which they say is essentially similar to that of the leading European clinics. The principal points in this technique are: (1) The hair is cut short. (2) Epilating doses are applied at five determined points of the scalp, the face, ears, and neck being protected. (3) The dosage must be measured accurately with a reliable radiometer. The authors rely upon either a Holzknecht or a Corbett radiometer. The quality of the X-ray is determined by some reliable penetrometer, such as the Benoist, aided by indirect methods, milliamperemeter, etc. (4) Hard rays, never less than No. 8 of the Benoist scale, are used, as soft rays generally give poor results. (5) The patient's head must not be allowed to move much during the exposure.

The hair falls out in about 3 weeks and begins to regrow in about 3 months. HOLLIS E. POTTER.

Lange, S.: *Sarcoma of the Upper Jaw Symptomatically Cured by the X-Ray.* *Lancet-Clin.*, 1915, CLXX, 417.

The author reports a case of sarcoma of the upper jaw of ten months' duration in a negro cured after

twelve X-ray treatments. Deep treatments with the Coolidge tube were begun April 1 at intervals of two weeks. Improvement was prompt and continuous, and by August 1 he was discharged, all visible and palpable evidence of the tumor having disappeared.

Lange thinks that in desperate cases it is justifiable to push the treatment until a dermatitis appears in order to give the patient the fullest benefit. HOLLIS E. POTTER.

Lannois and Patel: *Obliteration of the Lateral Sinus as a Method of Venous Hemostasis in Injuries in the Upper Cervical Region (De l'oblitération du sinus latéral comme procédé d'hémostase veineuse dans les blessures de guerre de la région cervicale supérieure).* *Lyon chir.*, 1915, 10, 515.

Injuries in the upper cervical region are very dangerous because of the copious hemorrhage that is apt to occur in any attempt at operation. Arterial hemorrhage may be controlled by ligation of the arteries, but the internal jugular cannot be ligated for the control of venous hemorrhage. The authors have found that it is possible to accomplish this result by obliterating the lateral sinus. It may be approached either by the mastoid or retromastoid route. The sinus is punctured and then tamponed with gauze. The gauze can be removed on the twelfth day. No harm results from the obliteration of the sinus and hemorrhage is effectively controlled.

The authors have applied the above method in 12 cases: 4 of extraction of projectiles at the base of the brain, 4 of diffuse carotid aneurism, 1 of arteriovenous aneurism of the internal carotid and internal jugular, and 3 of severe injuries of the neck with involvement of the blood-vessels.

A. Goss.

Hubeny, M. J.: *Roentgenology of the Skull.* *Illinois M. J.*, 1915, xxviii, 355.

The author believes that roentgenology of the skull is a field of distinct diagnostic value and in his opinion it is not used as frequently as it should be. It should be considered as a concomitant of the other measures of procedure.

The subject divides itself into three parts. The first deals with the size, form, and structure of the skull, also the varieties of skulls. The second division includes developmental errors and structural changes of the bone following inflammations and new growths.

The third division deals especially with the pathological conditions of the brain that produce characteristic changes, especially signs of pressure, as indicated in brain tumor, epilepsy, migraine, and psychoses.

Hubeny considers these three divisions in detail and shows the conclusions that may be deduced from the roentgenologic examinations.

HOLLIS E. POTTER.

Ester, E.: Repair of the Skull After Trephining (*Réparation tardive des pertes osseuses de la voûte crânienne consécutives à la trépanation*). *Bull. et mém. Soc. de chir. de Par.*, 1915, xli, 2569.

Ester gives the histories of 11 cases in which he repaired the opening left in the skull after trephining with gold plate. He used gold because it does not undergo any change. The operation was performed about two months after the trephining, after all signs of suppuration and inflammation had disappeared. After the most careful disinfection a flap of scalp was laid back, and a mold taken of the orifice. A piece of gold a quarter of a millimeter thick was then cut the same shape and size, two little projections being left to fit in between the tables of the skull; these projections are pushed in without difficulty and serve to hold the plate in place, and the soft parts are sutured over the plate. The results were excellent in 10 of the 11 cases, one patient died of brain abscess. There were signs of aphasia before the operation and they grew worse the next day. Ester does not know whether the infection was introduced at the operation or whether a latent abscess was simply reawakened. In all the other cases the patients were rendered much more comfortable and there was no longer any prolapse of the brain when they coughed or made any effort, as there had been before. A. Goss.

Manasse, P.: Treatment of Brain Abscess (*Zur Therapie des Hirnabszesses*). *München. med. Wchschr.*, 1915, lxi, 1475.

Much can be done to prevent brain abscess by careful treatment of all head wounds. They should be opened up thoroughly and examined and any foreign bodies removed. The wound should then be filled with loose gauze and left open. Skull wounds should never be sutured, as there are almost certain to be late complications if they are. Subdural hæmatomata should be treated conservatively; an intact dura should not be opened unless there are urgent symptoms. If a brain abscess forms in spite of these precautions it should be opened up freely and the pus drained out, care being taken to reach all pockets and recesses. Drainage should be provided with loose gauze; never with rubber or glass tubes. The first dressing should be left two or three days and after that the wound dressed daily. Each time the pus should be carefully but thoroughly sponged out. The patient must be placed in the best position for free drainage. He must be watched for any symptoms of retention of pus, such as fever, vomiting, headache, or localizing symptoms. If they develop the cavity must be palpated carefully with the finger to discover any recesses.

Sometimes secondary abscesses form in a prolapse, if so they must be opened up and if necessary the prolapsed part removed; if the prolapse shows no reaction it should be treated conservatively until it can be restored. If a fistula forms into the ventricle it generally results in basal meningitis

and death. The abscess cavity granulates very slowly so that the patients have to remain under treatment for months, and they should still be kept under observation after complete healing, for they are very subject to later diseases of the brain. For this reason the author does not believe in plastic closure of gaps in the skull. He has treated 11 patients with brain abscess in a military hospital and 21 in Strassburg. Of the first group 5 recovered and 6 died, and of the second 5 recovered, 4 died, and 12 are yet under treatment. In his five months' work in Strassburg Manasse had 265 cases of gunshot wounds of the head, in which 21 cases of brain abscess developed. A. Goss.

Bárány, R.: Open and Closed Treatment of Gunshot Wounds of the Brain (*Die offene und geschlossene Behandlung der Schussverletzungen des Gehirns*). *Beitr. z. klin. Chir.*, 1915, xcvi, 397.

Bárány treated 60 cases of gunshot injury of the brain at a hospital in Przemyśl, where he had an opportunity to observe them throughout the course of the injury. In all cases he cut away the bone until 0.5 cm. of the dura was exposed, and then carefully removed fragments of bone and foreign bodies. In the first 39 cases he left the wounds open, draining with gutta-percha strips, which he found to be the best for the purpose. He had 8 recoveries and 31 deaths, or 20.5 per cent recoveries. However, 5 of the cases were in almost a dying condition when admitted, and subtracting these it gives 23.6 per cent recoveries.

After having seen some cases in which bullets had passed entirely through the brain and in which the patients had recovered without infection, it occurred to Bárány that bullet wounds of the brain might not necessarily be infected primarily, and if they are non-infected closed treatment is indicated to prevent secondary infection. In accordance with this idea he operated on 21 cases as before and sutured the wounds at once in 14 of the cases; the other 7 cases were complicated by injuries of the eye and nasal sinuses. Of the 14 cases 4 died, but they were in a hopeless condition when admitted. The other 10 recovered, and in 7 of these cases the wounds were so severe that he believes they would not have recovered under open treatment. He thinks the majority of cases that can be treated within 24 hours after the injury are not infected, and that the wounds should be sutured, thus preventing secondary infection. Of course if they are already so severely infected that abscess has developed they should be left open and drained. A. Goss.

Jeger, E.: Plastic Closure of the Dura with Fascia in Gunshot Wounds of the Brain (*Ueber primäre Fascienplastik bei Schussverletzungen der Dura*). *Beitr. z. klin. Chir.*, 1915, xcvi, 418.

Jeger was a co-worker with Bárány in his work on gunshot injuries of the brain, and agrees fully with the latter's conclusions in regard to the superiority of closed treatment in such wounds. He

thinks the good results may be due to the fact that the brain is placed under better physiological conditions when the wound is closed, and so is better able to resist any infection that may have taken place. As a further step in the closure of such wounds he replaced the defect in the dura with fascia in three cases, the details of which are given. The fascia prevents adhesions between the brain and skull, and the later results of such adhesions, as fistula and brain prolapse. Moreover the physiological conditions are more completely restored when the brain is enveloped in all its coverings, and the fascia offers a still further protection against infection from outside. It also makes it possible to perform a secondary operation to repair the skull without exposing the brain. The fascia also has a haemostatic action that furthers recovery.

Jeger has thus far performed the above operation only in cases where there was such a large defect in

the dura that there was danger of prolapse. The fascia is simply cut out and laid with its inner surface next the brain after the wound has been cleansed. The edges of the fascia are pushed quite a distance in between the dura and bone. Sutures are not necessary. Considerable fat was left on the fascia and this helped to fill in the gap in the bone. There was healing by first intention in all the cases. He believes that primary suture in brain wounds with plastic closure of the dura brings about quicker and more favorable results than open treatment.

He also suggests as an operative possibility in inflammatory hydrocephalus externus a combination of a plastic operation on the dura, with the suturing of a piece of vein, one end under the fascia and the other in the external jugular, so as to drain off the fluid into the vein. He performed this operation in one case, but the patient was in too serious a condition to be saved.

A. Goss.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Pfahler, G. E.: Deep Roentgentherapy in the Post-operative Treatment of Carcinoma of the Breast. *Intern. M. J.*, 1915, xii, 1018.

Pfahler's aim is to impress upon the surgeon and the general practitioner the importance of using roentgentherapy in combating carcinoma of the breast, even in the earliest cases, and to outline what he believes to be the most valuable technique for post-operative treatment.

There is a tendency to recurrence, according to the author's experience, in breast carcinoma of from 50 to 75 per cent, even with the earliest operation; and if there is glandular involvement there is recurrence in at least 75 per cent of the cases. The statistics of the Johns Hopkins Hospital indicate that only 17 per cent of the patients presenting themselves for operation for carcinoma of the breast are free from axillary involvement.

Pfahler estimates recurrence as likely to occur in 61 per cent of the general run of operated cases and that to this 61 per cent the post-operative roentgen treatment offers a chance of recovery. In fact he thinks that with this treatment the number of cures in more or less advanced cases can be doubled.

In cases that are inoperable, roentgen treatment should be given at once, for even in these some can be cured, and all can be made more comfortable.

Regarding post-operative roentgentherapy in cases in which there is no glandular involvement the records show that the percentage of cures runs to 81 per cent and, if doubtful cases be excluded, even to 100 per cent.

Better results are now obtained from thorough massive dose treatment by cross firing through def-

nite selected areas than from the older fractional dose methods. In general, treatment is given in from six to twelve different fields, such series of treatment being given in from one to two days and repeated at the end of three to four weeks until from three to six total series are given.

When practicable the first treatment is given through the open wound, just as the surgeon finishes the operation and before the suturing is done. This has not been found to jeopardize the success of the operation nor to interfere with the healing.

The dosage is twice the pastille dose of Sabouraud and Noiré and the rays are filtered through three millimeters of aluminum and one layer of cow leather.

HOLLIS E. POTTER.

Brunn, W. von: Treatment of Wounds of the Thorax (Zur Beurteilung und Behandlung der Brustschüsse). *Deutsche med. Wochenschr.*, 1915, xli, 1331.

Von Brunn has treated 83 gunshot wounds of the thorax, 9 of which were injuries of the wall only, but in the other 74 the lungs were also injured. Of the series 11 died, 6 of them being in a dying condition when admitted and the others having complicating wounds of other organs that caused death. In all cases there was hemothorax and in the beginning pneumothorax also. The pneumothorax was generally quickly absorbed. In 5 cases there was extensive emphysema of the skin, extending even to the finger tips, but this also disappeared spontaneously.

Generally the clinical picture is very alarming at first. The face is pale and anxious, the lips blue, the breathing labored and interrupted by frequent coughing, the pulse rapid and small, and the patient in a cold perspiration.

Injuries of the left lung are much more serious than those of the right; perhaps because of pressure on the heart or because of pressure or traction on the large vessels. There were 8 cases of open pneumothorax. A few such cases have been successfully operated on. A better procedure is to close the wound with the contents of the first-aid dressing packet and fasten it on air-tight with adhesive plaster.

The treatment of gunshot wounds of the thorax for the first two or three weeks should be strictly conservative. Morphine and rest are the most important points in treatment. Morphine has a really wonderful effect on the appearance of these severely wounded patients. As soon as the temperature indicates infection exploratory punctures are made; it does no harm, is valuable for diagnosis, and seems to have some therapeutic effect. Frequent puncture is preferable to operation in the early stages of infected pneumothorax, because of the danger of hæmorrhage and collapse in operation.

A. Goss.

Otis, E. O.: Artificial Pneumothorax. *Boston M. & S. J.*, 1915, clxxiii, 740.

After Forlanini, the pioneer, Brauer of Hamburg is probably the best authority on artificial pneumothorax at the present time, and has done more to place it on a permanent basis than any other.

In general, the accepted indications for pneumothorax are: (1) extensive unilateral, progressive, or chronic lesions which fail to respond to the ordinary treatment, or tuberculin; (2) recurrent or uncontrollable hæmoptysis, provided the lung from which the hæmorrhage comes is known. There is, however, a variance of opinion as to the applicability in incipient stages or last stages; some using it in the former when there appears to be no recuperative power or improvement under ordinary treatment, and others using it in the hopeless or doomed cases as a last resort. Nevertheless, there is no doubt that the unilateral case with practically no active involvement in the other lung and with a fair amount of resistance is the ideal situation.

The possibility in every case of pleural shock, infection, gas embolism, subcutaneous emphysema, and circulatory disturbances must be borne in mind.

The X-ray should be used both before and after artificial pneumothorax as a guide in every application.

The apparatus should be as simple as the conditions will allow. It should have a good manometer, easily read, and an arrangement for regulating the flow of gas, which must be steady.

Otis concludes that while the scope of artificial pneumothorax has not yet been determined fully, yet it occupies an assured place in tuberculosis therapy. It must be remembered, that it should not, on the other hand, supersede the accepted modes of treatment; i.e., fresh air, rest, and good food.

PHILLIPS M. CHASE.

Jacobaeus, H. C.: Intrapleural Operations with the Aid of the Thoracoscope (*Endopleurale Operationen unter der Leitung des Thoraskopis*). *Nord. med. Ark.*, 1914, xlvii, No. 25.

Jacobaeus describes his method of freeing pleural adhesions that otherwise interfere with the carrying out of artificial pneumothorax. By means of it he renders cases amenable to pneumothorax that would not otherwise be, and thus saves them from the much severer operation of rib resection. When an attempt is made at pneumothorax and it fails on account of adhesions he introduces the thoracoscope under local anesthesia through an intercostal space, and is thus enabled to get a direct view of the adhesions, which he then burns out with the galvanocautery.

The author reviews the cases previously published by himself and Tidestrom in 1914, and gives the details of three new cases. In comparing what was found at operation with the adhesions shown in the roentgen picture he has found that the adhesions are generally more extensive and numerous than the roentgenogram shows them to be. Of course the technique demands a considerable amount of skill and practice, so the operation should be practiced on animals before being performed on human beings. The great advantage of the operation is that the operator can see everything he is doing. No adhesions escape him as they might if he depended on the roentgen picture alone, and if there are any blood-vessels in the adhesions he can see and avoid them. The objection has been urged that the field of vision is too small, but Jacobaeus finds that this is not true after one is thoroughly familiar with the technique.

A. Goss.

Cotton, F. J.: Pneumodynamics of Empyema. *Boston M. & S. J.*, 1915, clxxiii, 804.

Pressure in the pleural cavity is changed from a negative to a positive pressure by the presence of fluid. When the chest is opened the pressure may become atmospheric or even negative if a valve action results at the openings. Many methods have been devised to allow a valve action at the site of the wound, allowing fluid to run out, but no air to enter. A moist dressing is the simplest. An ingenious suction apparatus is recommended by the author. A valve dressing made of rubber drawn over the edge of the drainage tube is also highly recommended.

J. H. SKILES.

Lord, F. T.: The Medical Aspects of Empyema and Pulmonary Abscess. *Boston M. & S. J.*, 1915, clxxiii, 798.

As to whether the treatment of pleurisy with effusion should be medical or surgical depends upon the character of the fluid. Excluding all but the inflammatory fluids, an important matter to decide is whether the treatment should be by thoracentesis or by operation.

It is generally agreed that clear serofibrinous fluid should be evacuated when there are pressure

symptoms, or when the fluid is large in amount, or when a medium amount of fluid has persisted for two to three weeks in spite of medical treatment. In these cases thoracentesis is the method of choice.

Where the fluid is on the borderline between a serous and a purulent fluid it is sometimes difficult to decide as to the treatment indicated. Turbid fluids showing merely an excess of polymorphous leucocytes secondary to lobar pneumonia or due to the pneumococcus are relatively favorable for the thoracentesis. With abundant or necrotic leucocytes and positive cultures for pneumococci operation is usually necessary. Streptococcus infections usually demand operation. In the presence of large collections of pus in the pleural cavity in patients who are gravely ill, evacuation by thoracentesis may well be undertaken as a life-saving measure preliminary to operation.

The etiology of lung abscess centers around a variety of factors. Bronchopneumonia and lobar pneumonia are prominent causes. In 85 cases of bronchopneumonia coming to autopsy abscesses showed in 16, and among 31 cases of lobar pneumonia 14 cases showed abscess at autopsy. Aspiration of infected material during etherization, extraction of teeth, removal of tonsils, adenoids, the inhalation of foreign bodies, and submersion are all important factors.

Lung abscesses are more often multiple than single and are usually near the periphery. The clinical symptoms are those of sepsis with usually some local findings. The local findings of greatest importance are: dullness or percussion, X-ray findings, and elastic tissue in the sputum. It is very necessary to exclude tuberculosis, usually easily done by repeated sputum examinations. Exploratory puncture is deplored because of possible hemorrhage from unprotected vessels in the abscess cavity.

Surgery offers the greatest hope but should not be applied carelessly. Careful localization of the abscess, usually suggested by the X-ray, is essential before the operation is undertaken. J. H. SKILES.

Lund, F. B.: The Treatment of Chronic Empyema.
Boston M. & S. J., 1915, April, 308.

The best treatment is prophylactic, that is, early drainage. Many operations have been devised to cure chronic empyema. Schede and Oestlander both practiced mutilating operations with some success. The decortication of de Lornée is accomplished by excising portions of several ribs, stripping the thick fibrin covering from the surface of the lung and allowing the bleeding surface to become adherent to the chest wall, thus obliterating the empyema cavity. This operation has been successful in a fair proportion of cases. J. H. SKILES.

Massini, R.: Treatment of Acute Empyema (Ueber die Therapie des akuten Empyems). Therap. Monatsh., 1915, xiii, 392.

Massini believes that the reason there is so much diversity of opinion as to the best method of treat-

ing empyema is that emphasis is laid on the immediate operation, while as a matter of fact by far the most important thing is the after-treatment; and as the cases vary greatly in their course the after-treatment must be strictly individualized. The pus is thickest in staphylococcus empyema, thinner in those caused by streptococci and pneumococci, and thinnest in the putrid empyema caused by anaerobic bacteria. It is the latter class of cases that affect the heart most, so that a rapid decrease in pressure is dangerous.

He believes the best method of treatment is simple puncture with a trocar having an inner diameter of about 7 mm. The next day the drainage tube is fastened to a water-jet pump for the purpose of aspiration drainage, a self-regulating manometer being interposed. If it is a simple empyema with only one cavity suppuration generally ceases in a few days, but some cases require weeks of treatment. If the flow stops it is generally because the end of the drain inside the thorax is no longer in the secretion. In such cases it is well to disconnect the pump and irrigate with a 1:5,000 solution of potassium permanganate, introduced 10 to 20 ccm. at a time, and repeated till several hundred ccm. have been given, when the pump is reattached. Sometimes it is necessary to take the drain out and change it. The drain should not be removed too soon, as the wound may close up from the outside and cause absorption of pus. It is better to leave the drain in too long than to remove it too soon. When not more than 5 ccm. of pus is discharged and the patients are free from fever they may get up. Breathing exercises should then be begun and continued with patience and perseverance. These exercises produce quite remarkable results, even in extreme cases; in one of his cases of extensive empyema with several pockets in which a fistula had persisted for a year, these exercises brought about almost as much expansion as on the normal side. These exercises also prevent secondary lung complications in later years. Roentgen examination at the beginning of and throughout the treatment is very important. The details are given of 17 cases that Massini has treated in this way, with recovery in all the cases of uncomplicated empyema; one patient died of bronchial carcinoma and three of pulmonary tuberculosis. A. Goss.

Tongu, Y.: Experimental Study of Transplantation of the Thymus (Recherches expérimentales sur la transplantation du thymus). Mém. & d. méd. Pub. d. l'imp. Univ., Tokyo, 1915, xiv, 172.

Tongu reviews the rather scanty literature on the subject and describes his own experiments on dogs and rabbits. He found that the most favorable site for autoplasmic transplantation was the peritoneal cavity, especially the mesentery. Thymus transplanted into the spleen, subcutaneously, into the abdominal muscles or under the peritoneum disappeared rapidly by absorption. Transplanted

thymus does not regenerate like other tissues, but atrophies more or less. This is particularly true of the medullary substance. Thymus removed by total thymectomy and transplanted autoplastically to the mesentery may persist for two months, but will be slightly atrophied. A plate is given showing the microscopic appearance of the transplanted thymus.

A. Goss.

TRACHEA AND LUNGS

Whittemore, W.: Lung Abscess and Bronchiectasis from a Surgical Point of View. *Boston M. & S. J.*, 1915, cxcvii, 811.

The treatment of bronchiectasis is almost entirely medical. Rare cases where one lobe of the lung has become partially obliterated may be successfully treated by removal of the lobe. Injection of nitrogen gas into the pleural cavity has been tried with some success.

The treatment of lung abscess is primarily surgical. Operation is best done in two stages to make sure of the walling off of the general pleural cavity by protective adhesions. Brilliant results are often obtained, using intratracheal ether for the anæsthetic.

J. H. SKILES.

Oeri, F.: Three Cases of Extrapleural Pneumolysis and Filling by Baer's Method (Drei Fälle von extrapleuraler Pneumolyse mit sofortiger Plombierung nach Baer). *Cor.-Bl. f. Schweiz. Aerzte*, 1915, xlv, 1364.

The best method of accomplishing compression of the lung for the treatment of tuberculosis is by artificial pneumothorax, but there are a considerable number of cases in which this is not applicable. For such cases Baer has proposed the method of extrapleural pneumolysis, followed by the injection of paraffin. A small hole is made over the diseased part of the lung by the partial resection of a rib. The lung together with both layers of the pleura is separated from the thoracic wall, the separation taking place between the costal pleura and the endothoracic fascia. The cavity wall is then pushed in so as to fill up the cavity, and the extrapleural space thus formed is filled up with paraffin, which is of such consistency that it can be kneaded at body temperature; then the wound is closed.

The advantages of this method over pneumothorax are that the exact degree of compression can be regulated; the diseased part alone can be compressed without affecting normal parts; it can be done in cases where adhesions prevent pneumothorax; and it does not have to be repeated as does pneumothorax. It is not nearly so trying on the patient as a thoracoplastic operation. Theoretically the objection has been urged that there is danger in introducing a foreign substance into the thorax; but paraffin has practically been injected into all regions of the body without doing any harm. The results were good in all three of the cases which are described and illustrated in Oeri's article, and

they were all cases in which attempts at artificial pneumothorax had been unsuccessful.

The first patient was a young woman of 24, who for four years had had profuse expectoration, slight hæmorrhage, and periods of fever, which persisted in spite of hospital and sanitarium treatment and which were caused by a cavity in the apex. Since the operation fifteen months ago she has been free from fever, able to work and almost free from expectoration, except for a little while in the winter when she was somewhat worse.

The second case was that of a young man of 22 who had had pulmonary tuberculosis since the spring of 1909. A suppurating cavity was obliterated by the injection of paraffin and he is now free from the toxic symptoms due to the suppuration. There has been no advance in the tubercular process since the operation, twenty-one months ago.

The third patient was a man of 27 who had hæmorrhages, fever, and profuse expectoration. He is now free from all symptoms and able to work. No harm resulted from the injection of paraffin in any of the cases.

A. Goss.

Duval, P.: Extraction of Foreign Bodies from the Lungs (A propos de l'extraction des projectiles intrapulmonaires). *Bull. et mém. soc. de chir. de Par.*, 1915, xli, 2137.

Marion has reported 27 cases of extraction of foreign bodies from the lung and Duval has extracted 14. Duval agrees with Marion that all foreign bodies should be extracted from the lung.

All patients with foreign bodies in the lung have persistent local pain and dyspnoea which increases on effort to move. On radioscopic examination it is easy to see that the bullet is surrounded by an area of consolidation, whether or not this area is adherent to the thoracic wall; and even when the lung appears normal and is not adherent its expansion is less than that of the other lung. The mere presence of the foreign body decreases the general function of the organ. Radioscopic examination should be made, not only to localize the foreign body, but to determine the condition of the lung. Then the localization is made exact as to position and depth with a compass.

Marion extracts the bullet with the finger and tampons the lung wound, instead of suturing it. Duval admits the advisability of this method when there are pleural adhesions, but when the lung is free he brings the lobe out of the thorax, incises down on the foreign body, removes it, sutures the lung wound, returns the lung in a normal condition to the thorax and aspirates the intrapleural air by puncture. He holds that this does not create cicatricial tissue, as does tamponing, and it leaves the lung in better condition. It also obviates the necessity of refraining from operation when the bullet is deep in the lung. He had a case where it was shown to be between 8 and 10 cm. deep. By twisting the lobe around and opening it from the side instead of the front he had to go through

only 1 cm. of tissue. He describes three cases operated on in this way with ideal results.

A. Goss.

Mauclaire, P.: Removal of Fragment of Shell from the Lung (*Ablation d'un gros éclat d'obus intrapulmonaire*). *Bull. et mém. Soc. de chir. de Par.*, 1915, 55, 1954.

Mauclaire gives the history in detail of a case operated upon by Petit de la Villéon, and discusses the indications for removing foreign bodies from the lungs. He concludes that they should be removed if they are causing any trouble, such as pain on respiration, difficulty in breathing, repeated hæmoptysis, or signs of abscess. He would not advise operation if the projectile is more than 7 cm. deep in the lung.

Operation is a much less serious matter since radiocopy has made it possible to locate the projectile exactly. After having located it, an incision should be made parallel to the rib, the rib resected, the lung sutured to the wound, the pleura incised, and the lung explored until the body is found and removed. The lung wound is not sutured. The operation can be performed in a very few minutes and is not difficult.

Another possible method of extraction is with the electrivibrator. The functional results are good. No fatalities from the operation have been reported,

though there is a possibility of profuse hæmorrhage or syncope.

Mauclaire has failed only twice. In one case he found the projectile was between 8 and 9 cm. deep and gave up the attempt to remove it. In the other, the patient was not bearing the chloroform well and the operation was abandoned. A. Goss.

Head, G. D.: Gangrene of the Lung. *Am. J. M. Sc.*, 1915, 41, 700.

The diagnosis of gangrene of the lung is almost always made on the characteristic appearance and odor of the sputum. Where the characteristic odor and appearance of the sputum are absent the diagnosis is usually made at autopsy. In the present case the diagnosis was made by the aspirating needle.

The case in question was a typhoid patient with signs of dullness, distant breath sounds, and a few rales over the right lower lobe posteriorly. The findings were supposed to signify a tuberculous focus or an unresolved pneumonia. On introducing an aspirating needle a brown, foul material was withdrawn. Microscopically this fluid showed many leucocytes and epithelial cells undergoing fatty degeneration, and also much blood pigment. On these findings gangrene was diagnosed and operation performed. The patient died and the autopsy confirmed the diagnosis. J. H. SKILES.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Læwen, A.: Pathology and Operative Treatment of Gunshot Injuries of the Abdomen (*Erörterungen zur Pathologie und operativen Behandlung der Bauchschussverletzungen*). *München. med. W.chnsch.*, 1915, 121, 1331.

The author reports his experience in a well-appointed hospital on the western front, where he was able to operate on his patients on an average five and one-half hours after the wound was received. He operated on one case 24 hours after the injury and had recovery in 2 cases, one of which was operated upon 20 hours, and the other 13 hours, after the injury. In 54 operations he had 27 recoveries, or 50 per cent. He has never made a mistake in the differential diagnosis between an intra-abdominal injury and one merely of the wall. He advises leaving the patients two hours without morphine; if there is intraperitoneal injury they will within that time develop some of the signs: vomiting, rigidity of the abdominal walls, or rapid pulse.

There is generally no shock after abdominal injuries and Læwen describes a number of cases in which the patients had run considerable distances after being shot and climbed into the trenches.

He operated on most of his cases under a combination of local anaesthesia of the abdominal wall and morphine-chloroform-ether anaesthesia. After he

had lost two cases from aspiration of stomach contents under anaesthesia he adopted the plan of pumping out the stomach contents before operating. He made large incisions so as to examine the whole contents of the abdomen. Whenever possible he closed the wounds in the intestine with several series of silk sutures. He found it necessary to resect the intestine in only 3 cases. He painted the intestine with tincture of iodine before suturing. He tamponed wounds of the liver and in 3 cases closed injuries of the gall-bladder with a double row of silk sutures. The spleen was extirpated in 1 case and sutured in 2; all 3 recovered. The blood was always sponged out of the pelvis, but the abdominal cavity was not irrigated; not because he objects to abdominal irrigation on principle but because he could not always have sterile salt solution. He generally drained through the pelvis with one or two drains. He avoided buried sutures so far as possible in suturing the abdominal wound.

Most of the deaths were due to the fact that the injuries were extensive or that the patients had lost a great deal of blood. Recovery was without complication in about half the cases. Intestinal function was regained with remarkable rapidity, generally in about three days. It was not necessary to transport his patients soon, which is an important factor in recovery. A. Goss.

Quénu, E.: Treatment of Gunshot Wounds of the Abdomen (*Note sur le traitement des plaies de l'abdomen par projectiles de guerre*). *Bull. Acad. de méd., Par.*, 1915, lxxiv, 466.

Quénu points out the impossibility of deciding the question of operative or conservative treatment in abdominal injuries from the statistics that are available, because they are prepared under such different conditions. For instance, the statistics given in reference to conservative treatment show a mortality of from 33 to 100 per cent. The figures would have to be passed upon by a society of competent surgeons in order to be of any value.

It occurred to Quénu to try to decide the question from the comparative number of men who had been sent home after the different methods of treatment. He collected reports of 62 cases which had been sent home. Only 9 of these had been operated upon, leaving 53 treated conservatively, which would seem to indicate that this method was preferable. But on closer examination 28 of these were found to have had non-penetrating wounds, though they had been labeled as penetrating wounds when sent in from the field. In 5 other cases penetration was doubtful, which reduces the number of penetrating wounds to 20. Of these 4 died later and 3 had to be operated on later, which reduces the number of really penetrating wounds treated conservatively to 13. Of these 7 were simple penetrating wounds without lesions of the viscera, leaving only 6 with visceral injuries: 1 of the stomach, 3 not very serious ones of the liver, and 2 of the large intestine. This reduces the number to 6 as compared with 9 which recovered after operative treatment, and this in spite of the fact that more hospitals prefer the conservative treatment and consequently the numbers thus treated are larger than the numbers treated operatively.

Quénu believes that primary operation is preferable, provided there is a skillful surgeon and good enough equipment to give reasonable chances of success.

A. Goss.

Moots, C. W.: Unusual Contents of Inguinal Herniæ, with Report of a Case. *Am. J. Obst.*, N. Y., 1915, lxxii, 810.

The author gives brief reviews of cases and statistics which have appeared in the literature, and reports the following case which occurred in his practice.

The patient was a woman, aged 38, whose family history was unimportant. About nine years previous she had noticed a lump the size of a hickory nut in the region of the right internal abdominal ring. It remained about the same for eight years, when it sank lower and appeared to double in size. At this time it became very painful.

At operation the usual skin incision was made and then it was found that the mass could not be pushed up into the inguinal canal because it was adherent to the labium majus. An elliptical portion of the labium majus was excised in order to free

the mass, which now gave the impression of being the kidney. However, it was almost beyond identification and an opening was made in the peritoneum. The right kidney space was explored and found empty. The left kidney was found to be of normal size and in good position. A parovarian cyst 3.5 inches in diameter was found in the pelvis and a subperitoneal fibroid the size of a walnut upon the fundus uteri, and a hydrosalpinx on the right side. The exploratory incision into the peritoneum was quickly closed, followed by nephrectomy of the useless right kidney, and the inguinal canal was closed in the usual manner. The pelvic condition was then operated upon through a median incision. The patient made an uneventful recovery.

C. H. DAVIS.

Jacobson, J. H.: Further Experience With Local Anæsthesia in Herniotomy. *Am. J. Obst.*, N. Y., 1915, lxxii, 783.

The author reports that to date he has operated upon 125 cases of hernia under local anæsthesia, with no deaths. This experience has convinced him that, whenever possible, such operations should be performed under local anæsthesia. The only exception to this should be in cases of herniotomy in children and where the operation must be performed in uncontrollable nervous adults. The latter exception in actual practice is not frequent, since most nervous individuals can be controlled by carefully explaining to them the nature of the operation and the reasons for operating under local anæsthesia. No other form of anæsthesia gives the same degree of safety as does the modern Braun technique of local anæsthesia.

C. H. DAVIS.

GASTRO-INTESTINAL TRACT

Aaron, C. D.: The Roentgen Ray in Gastro-Intestinal Affections. *Am. J. M. Sc.*, 1915, cl, 330.

Aaron criticizes the present-day methods of roentgenological examination, particularly of the gastro-intestinal tract. He says that there is a lack of uniformity in such methods; and that in order that the limitations and possibilities of roentgen diagnosis may be established it is necessary to secure a standardization of methods and technique. Thus in the matter of test-meal there is no standard, the American, German, and English test-meals all differing.

The author believes that the courses offered for the study of roentgenology in both graduate and post-graduate schools are too limited, and that a number of men now acting as roentgenologists have not the necessary preliminary training to properly qualify them for their work.

Aaron suggests that no patient should be subjected to operation without a confirmation of the original findings by a second roentgenological examination made after an interval of a few days. He quotes a number of cases to illustrate errors that may occur

from faulty interpretation of X-ray findings by either the roentgenologist or clinician.

HOLLIS E. POTTER.

Dever, F. J.: Roentgen Rays in the Study of Gastric Diseases. N. Y. M. J., 1913, 33, 799.

Dever points out that roentgen investigations have completely changed the former conceptions of the peristaltic movements of the stomach, and the nervous reflexes which govern them. The pyloric reflex, like other delicate mechanisms of the body, operates through the autonomic nervous system and is subject to disturbances of function entirely independent of organic disease in the duodenum or stomach. Food may be retained an abnormally long time with good peristalsis without necessarily indicating organic pyloric obstruction or ulcer. This may explain cases in which operation disproves the X-ray diagnosis of ulcer. Besides, peculiar fluoroscopic observations may often be explained either by the quality of the food or by the amount introduced.

Excepting the cases in which retention of bismuth is seen in the ulcer, and cases in which the evidence of chronic perforation is plain, Dever does not believe that gastric ulcer can be diagnosed by means of the roentgen ray.

Regarding the unsatisfactory results and the recurrences which are often noted after gastro-enterostomy, valuable information has been afforded by X-ray studies. Cannon and Blake in their animal experiments, by means of X-rays, have found that notwithstanding the abnormal exit the pyloric end of the stomach becomes filled and a large part of the liquid contents passes through the pyloric sphincter. From their studies Dever says that it is evident that a gastro-enterostomy does not prevent acid stomach contents from coming in contact with the ulcer either in the stomach or the duodenum.

Although the roentgen rays have made it possible to discover gastric cancer earlier than formerly, yet it is questionable if, even with this aid, a sufficiently early diagnosis can be made. Dever suggests that patients of middle life showing symptoms which might suggest ulcer should invariably be studied by an expert roentgenologist. Evidence of carcinoma may be thus obtained much earlier than clinically, and laparotomy with its concomitants obviated.

Dever also points out the valuable aid that the roentgen rays may give in the study and treatment of gastropnoia.

HOLLIS E. POTTER.

Friedenwald, J., and Baetjer, P. H.: Value of the X-Ray in the Diagnosis of Gastro-Intestinal Disturbances. N. Y. M. J., 1913, 33, 929.

The authors consider that the diagnosis of duodenal ulcer is much simpler than that of gastric ulcer. The presence of a simple duodenal ulcer can always be ruled out, but not so with gastric ulcer. The true line of distinction is the fact that in an irritating lesion of the stomach, such as ulcer, the

hypermotility causes a tonic contraction of the pylorus with retention of gastric contents over a shorter or longer period, as well as deformity, according to the situation of the ulcer. In a lesion of the duodenum there is a hypermotility, not only of the duodenum, but of the stomach itself; but in this case there is not the spastic condition of the pylorus, and consequently the hypermotility produces rapid emptying of the stomach contents. The X-ray findings of the two conditions are so markedly different that the method affords an almost positive means of differentiation.

The diagnosis of gastric ulcer is dependent upon the functioning of the stomach and the finding of the filling defect. The filling defect can be demonstrated only when it is situated along the anterior surface of the lesser and greater curvatures. On the other hand, it matters not what the situation of the ulcer is, the functions of the stomach are materially affected.

The X-ray diagnosis of gastric cancer and other affections of the gastro-intestinal tract are dealt with *serialim*. Regarding points the authors think that since the X-ray examination has become so widely used, the interpretation of the significance of the prolapsed bowel has been entirely too broad, for there are many patients in whom the transverse colon has prolapsed into the pelvis and yet there are no evidences of digestive disturbances.

HOLLIS E. POTTER.

Zoeppritz, H.: Diagnostic Value of Albumin in the Stomach Contents (Die diagnostische Bedeutung der Eiweißbestimmung im Magensaft nach Salomon). Mitt. d. Grenzgeb. d. Med. u. Chir., 1915, XVIII, 777.

In 1904 Salomon published a report of his method of determining albumin in the stomach contents, and announced it as a method of distinguishing between ulcerative and non-ulcerative processes, the theory being that the serum secreted from the ulcers contained albumin.

Zoeppritz has examined 148 cases of stomach disease with a view to determining the value of the reaction. Of the series 61 were cases of carcinoma of the stomach, 29 were ulcers, 13 were cases of chronic gastritis, 10 of other stomach diseases, and 35 of different abdominal diseases in which the stomach was not involved. Diagnosis was confirmed by operation in 98 of the cases, and tables are given showing in detail the findings in these cases.

Zoeppritz concludes that the test does not furnish a differential diagnosis between ulcerative and non-ulcerative disease. If there is stagnation of the stomach contents albumin will collect over night, even if only a slight amount is produced, and if motility is normal or exaggerated it will be passed on into the intestine, even if a considerable amount is produced. Therefore a negative reaction has more value if there is stagnation, and a positive one more value if there is normal or increased

motility. The secretory function of the stomach also has an effect on the albumin test. If there is free acid the albumin is soon changed into albumoses and peptones, so that decreased acidity promotes a positive albumin reaction. Conclusions drawn from the albumin test are only valid, therefore, when the motor and secretory functions of the stomach are normal.

If it is a question of differential diagnosis between stomach cancer and chronic gastritis, positive albumin indicates cancer. A negative albumin reaction indicates that cancer is not present. In a few cases albumin can be demonstrated in the normal stomach contents; it is somewhat more frequent in chronic disease of the stomach. In comparison with the other well-known tests for cancer of the stomach the albumin test ranks fourth; that is, blood can be demonstrated in 95 per cent of cases, emaciation in 90 per cent, an acidity in 89 per cent, albumin in 83 per cent, lactic acid in 67 per cent, long bacilli in 64 per cent, and a palpable tumor in 64 per cent. The test is somewhat trying on the patient, especially if there is stagnation of the stomach contents; it is sometimes necessary to use as much as 20 liters of water before it comes out perfectly clear; this can hardly be done in very weak individuals. Moreover, if there is the slightest lesion of the stomach wall the resultant bleeding will nullify the value of the test. A. Goss.

Carman, R. D.: Roentgen Diagnosis of Gastric Cancer: Report of Twelve Cases. *Am. J. M. Sc.*, 1915, cl, 625.

The author shows the additional evidence which the X-ray is able to give in the diagnosis of gastric cancer, especially in those cases where other confirmatory evidence is lacking. The chief findings of the X-ray are: filling defects; alterations of pyloric function, either gaping or obstruction of the pylorus; perversion of peristalsis, e.g., absence of peristalsis from involved areas, weak peristalsis, antiperistalsis, exaggerated peristalsis, or irregular peristalsis; altered motility, either rapid or delayed emptying; lessened flexibility; lessened mobility; diminished size; displacement.

In considering the X-ray findings it is very essential to rule out spasm of the muscles of the stomach, perigastric adhesions, reflex disturbances, disturbances of adjacent organs which might result in abnormal X-ray findings. Tumors of the stomach other than cancer must of course be considered.

The reports of 12 cases are complete and illustrate the importance of making an early X-ray examination of every patient past the cancerous age who complains of stomach symptoms. J. H. SKILES.

Smithies, F.: Blood-Cell Changes in Gastric Cancer. *Physician & Surg.*, 1915, xxxvii, 433.

Smithies has made an exhaustive study of the blood counts in 267 operatively and pathologically demonstrated cases of cancer of the stomach.

The average erythrocyte count was 4,380,000. The minimum erythrocyte count was 860,000—a case of inoperable tumor with ascites and extensive, general metastases. The maximum red cell count was 6,328,000—a patient with inoperable cancer of the lesser curvature and the body of the stomach with metastases to the peritoneum. The average number of erythrocytes is rather higher than that given by other investigators, but Smithies explains this partly on the basis that many of his cases were diagnosed early and that the large number of cases studied returned a fairer average than would be expected from a study of a small list. It was seen that while low red cell counts were noted frequently in instances where a hopeless gastric neoplasm existed, normal or even higher than normal counts were obtained late in the progress of the disease. It would seem that diminution in red cell count depends not wholly upon the development of metastases. In the author's series a larger group of cases with extensive metastases had higher average red cell counts than had that group which was free from metastases.

In Smithies' observations upon 454 cases of gastric cancer, it was observed that in 72.2 per cent of the patients the hæmoglobin ranged between 50 and 100 per cent; that in 42.2 per cent of cases it was above 70 per cent. The average hæmoglobin for the series was 64.3 per cent; the minimum was 25 per cent; and the maximum 97 per cent. It was shown that low hæmoglobin percentages are of relatively little worth in indicating the presence or absence of metastases.

In the author's series the average color index was 0.73; the minimum index was 0.32; and the maximum 0.97.

Not uncommonly red cells were noted that exhibited wide variations in shape and size. There were 17 instances where an excess of macrocytes was observed and 8 cases in which megaloblasts were recorded. In 23 instances—10.7 per cent of the cases studied—no megaloblasts were noted. Neither macrocytes nor nucleated red cells were ever observed where the erythrocyte count was higher than 3,500,000 cells or the hæmoglobin more than 70 per cent. Not infrequently variations in erythrocyte structure seemed out of all proportion to the red cell count or the hæmoglobin.

Complete counts were made in 261 cases. The average white cell count was 11,270 cells. The minimum was 4,200 and the maximum 36,200. More than four out of five cases had leucocyte counts between 6,000 and 14,000 cells. Not quite one out of every four cases had white cell counts above the average for the series. The author's study did not disclose that, as has been commonly supposed, leucocytosis proved an index to the extent of metastases, the rapidity of growth of a tumor or such complications as hæmorrhage or perforation.

As to the qualitative variations in leucocytes the polynuclear leucocytes averaged 72.2 per cent; small lymphocytes averaged 19.1 per cent; large

lymphocytes averaged 1.41 per cent; transitional leucocytes averaged 1.48 per cent; myelocytes averaged 1.27 per cent in 45 instances where such were observed. The latter were frequently noted where the red cell count was above 4,000,000 cells, but were observed in no case where the haemoglobin was more than 74 per cent. Eosinophiles were observed in 67 per cent of the differential counts, the average was 4.01 per cent, the minimum was 0.3 per cent, and the maximum 7.7 per cent.

Graham, C.: Gastric and Duodenal Ulcers. *Boston M. & S. J.*, 1913, cliam, 543.

Pain is a very important symptom in the diagnosis. It comes usually at an earlier period after eating in gastric ulcers than in duodenal. It is usually relieved by food, an alkali, vomiting, or irrigation. Pain is the one constant diagnostic factor in all peptic ulcers. Freedom from pain is recorded in less than one per cent of patients. Pain may be of several varieties, such as distress, aching, burning, gnawing, pressing, boring, sharp cramps, colic, etc.

Pain at night appears to be more frequent in duodenal than in gastric ulcer. Lying down causes ease from pain more frequently in gastric ulcer. Vomiting occurred in 79 per cent of duodenal cases and 82 per cent of the gastric. Gas was present in 77 per cent of the duodenal and 94 per cent of the gastric.

Hemorrhage from the stomach occurred in 25 per cent of gastric ulcers and 18 per cent of duodenal. Blood by the bowel was recorded in a similar percentage of cases. Perforation was about equal in both classes of cases—duodenal 28.7 per cent and gastric 26.2.

J. H. SKILES.

Duffy, G. V.: Hematomesis Following Apparent Acute Indigestion; a Case Occurring in an Infant. *J. Am. M. Ass.*, 1913, lxx, 1912.

The patient, a male child, aged 2 months, weighed at birth 6.5 pounds. Though of small size, he was apparently healthy. He was bottle fed from the beginning.

The illness began during the hot days with vomiting, diarrhoea, and fever. The abdomen was distended; the child was very restless and cried continually. After the second day the temperature became normal, vomiting ceased, the bowels were constipated; abdominal distention and pain alone remained. On the fourth day the child passed into a state of semiconsciousness—respirations were interrupted and were of the Chryne-Stokes type. On the fifth day he passed a large watery stool; the distention was much less, the respirations became quiet and regular, the condition of stupor disappeared, the eyes appeared bright, and a better color returned to his skin. About 3 p.m. on the fifth day the child became suddenly weak and pale, but in a few minutes appeared much better. About 5:30 p.m. he vomited about a teaspoonful of dark brownish fluid. The child, however, apparently

continued to gain strength until 6:30 p.m., when he suddenly vomited a very large amount of blood, dying while vomiting.

EDWARD L. CORNELL.

Strauss, A. A.: New Methods of Pyloroplasty for Congenital Pyloric Stenosis. *J. Am. M. Ass.*, 1913, lxx, 1533.

Strauss calls attention to the remarkable results of Richter and Scudder in dealing with this condition.

The gravity of posterior enterostomy as a surgical procedure, successfully practiced by Richter and others on the moribund infants brought for relief, led to the evolving of the new procedure.

Two cases are cited in which posterior gastroenterostomy was performed successfully, though causing much shock, but death followed the operation in both cases, in ten days and six hours respectively.

He classifies the pyloric cases as follows:

1. A. Large tumor, almost complete compression of mucous membrane and complete obstruction.
- B. Small hypertrophy of the muscularis, complete obstruction.

2. A. Large tumor, partial compression of the mucous membrane, partial obstruction.

- B. Small amount of hypertrophy of the muscularis, with only partial compression of the mucous membrane and only partial obstruction.

Strauss believes that many of the so-called pylorospasms which are treated medically with good results but which show symptoms from time to time, belong to the class of hypertrophy with partial obstruction.

He speaks of the difficulty of suturing at right angles an incision of the hypertrophied muscularis, as is done by Weber, and notes that the Ramsteadt, Nicolls, and Weber operations produce hernia of the mucous membrane on one side only, but do not reduce its volume nor that of the muscularis.

He has demonstrated on dogs how easily the mucous membrane can be shelled out by everting the muscularis. He speaks of a series of experiments not yet reported in which one-half of the circumference and one-half of the length of the pylorus and the pyloric antrum were resected. The defect was closed by two free fascial transplants and no paresis occurred. Fluoroscopic examination showed a normally functioning pylorus. When the muscularis is separated from the mucous membrane Auerbach's plexus is separated from Meissner's, which the author suggests might account for the paresis of the pylorus. He says this is the first essential step in the pyloroplasty. By cutting down to the mucosa and shelling it out he reduces the folds of the infolded membrane and produces a paresis of the spastic pylorus. The second part is to reconstruct the hypertrophied pylorus to its normal thickness. This can be done by either cutting away the inner circular layer or utilizing it as a plastic flap.

He cites four cases operated upon, the description of which should be read in the original article to get a clearer understanding of the procedure.

When the hypertrophy is type B, the mucous membrane is shelled out, but instead of a plastic flap being made the larger portion of the inner circular muscle is removed.

By the second method, with small hypertrophy of the muscle and complete compression of the mucous membrane, he removes a small piece of the anterior sheath of rectus with some of the muscle. This fascial transplant is used to reconstruct the pylorus after shelling out the mucous membrane. This has only been done on dogs.

He briefly discusses the etiology, touching on some experimental work he is conducting with Abt to learn whether the condition is congenital or a spastic hypertrophy.

His conclusions are that the advantage of the above procedures over posterior gastro-enterostomy are:

1. The incision is very small in contradistinction to that necessary in performing gastro-enterostomy.

2. The prevention of a large amount of shock.

3. The methods of procedure described above cover every form of pathological condition so far found in congenital pyloric stenosis.

4. The operations reconstruct a pathological pylorus as to the size of the lumen and the thickness of the muscularis. The normal physiological relations between the stomach, duodenum, liver, and pancreas are maintained. The duration of the operation is one-third that of a posterior gastro-enterostomy.

DONALD GORDON.

Snow, I. M.: Early Diagnosis of Intussusception.
J. Am. M. Ass., 1915, LXV, 1524.

Snow reviews the early symptoms of intussusception which occur when there is still time to save a patient too young to describe his sufferings.

A long mesentery and active peristalsis are the conditions favorable to produce the lesion. He says the circular muscle fibers of the small intestine contract and the upper segment of the ileum is driven through the narrowed lumen. There is occasional spontaneous release. Peristalsis is increased by the obstacle and several inches of the small intestine are pressed into the lower segment. The mesentery is dragged in, which aggravates the obstruction. The condition usually occurs in the ileum. The mass of bowel is pushed through the ileocecal valve dragging the cæcum and colon with it. The intussusception by its attachment to the mesentery moves in the arc of a circle and may be rotated to any region of the abdomen.

The effects are: (1) Agonizing pain, the child's crying often indicating the moment of obstruction. (2) It arrests the fecal current, stops digestion, and produces vomiting. (3) At the site of obstruction, acute swelling and congestion produce a tumor mass which prevents the release of the invaginated

intestine, causing bleeding and a discharge of bloody mucus through the rectum.

The principal symptoms are pain, tumor, and bloody rectal discharge. The child always cries, sometimes continuously, sometimes intermittently. The face is pinched, pale, cyanotic, and typical of shock. After a few hours the symptoms of shock pass away and the pain ceases for a few hours. This amelioration is due to the œdema of the intestine and the physician should beware of this lull.

Vomiting starts with pain and is due to intestinal arrest and regurgitation of duodenal fluid. It may occur every hour or two with remissions.

It is aggravated by food and laxatives. It is rarely absent in acute intussusception. The child refuses food. Fæcal vomiting is infrequent. The child is usually breast-fed and not prone to vomiting.

A tumor may be found in any quadrant of the abdomen, it is not sensitive and feels like a walnut or a potato; may appear and disappear under the liver or into the pelvis. A mass is frequently undiscovered and a diagnosis must be made from other symptoms.

Protrusion of bowel through the rectum is a late sign indicating telescoping of long portions of the intestine. Rectal prolapse is easily reduced, a mass of intestine is not.

Rectal examination should be made in every suspicious case. This may start a hæmorrhage, or reveal a high rectal mass. A bimanual examination may reveal a mass of telescoped bowel.

At times when the child is not crying the abdomen may be soft and relaxed; it may be distended later. Peritonitis is a rare late development but there is often an effusion of peritoneal fluid. Adhesion of the bowel wall is unusual. The chief obstacle to reduction is swelling.

The surface of the intestine is often purple and the bruised appendix in a condition leading to infection. After relief of obstruction a persistent diarrhœa may show the damage to the intestinal mucosa.

The heart action is good for a day or two. Fever is not a usual symptom, but many cases may have a rise of temperature in a few hours from intestinal toxæmia.

As to the course of the disease, if the obstruction is not relieved the patient will die from the above symptoms in from two to seven days. Spontaneous sloughing of the intestine will occasionally occur.

A suspicious case should be watched carefully, food and laxatives avoided, and opiates used to mask pain.

A bloody mucous stool is almost a certain symptom of intussusception. There may be a hæmorrhage or bloody mucous dysentery; the latter is pathognomonic of intussusception when passed suddenly.

When the intestinal hæmorrhage is seen a day after onset it is too late for early diagnosis.

Complete obstruction prevents passage of gas. The passage of large amounts of gas may exclude intussusception.

If with the above symptoms the thermometer or examining finger shows blood the diagnosis becomes a certainty. An X-ray of the intestine after an injection of bismuth is strongly advised. Snow has seen the X-ray confirm the diagnosis three times. He advises immediate surgical consultation and shifting of responsibility.

As to the operative procedure, a minimum of anesthetic should be given. Evisceration should not be done to find the obstruction. The incarceration should be pushed not pulled out. The appendix should not be unnecessarily removed. The mortality is diminishing.

The general opinion is that early diagnosis means easy operation; the credit for saving the child going to the physician who recognizes at once an atypical case.

A report is given of four cases operated upon 20, 16, 68, and 86 hours after onset. The two cases operated on early recovered, the two others died.

DONALD GORDON

Benmosche, M.: A Preliminary Report on a New Method for Facilitating Intestinal Anastomosis. *Internat. J. Surg.*, 1915, XXIII, 177.

In devising a new method for facilitating intestinal anastomosis, Benmosche has devised what he terms a gelatine bolus, prepared in the following manner. Fifty per cent sheet gelatine is boiled in normal saline with one per cent trikresol run into molds of adopted sizes and placed in the refrigerator to set, subsequently rolled in some antiseptic powder and cut to any size or shape desired. This can be kept indefinitely at room temperature, but obviously retains its solidity better in a cool place. The resected gut ends are slipped over the bolus and the ends readily sutured. The bolus is allowed to remain *in situ* and it dissolves in about three hours. It acts as a plug temporarily preventing the escape of contents and it has other advantages, which the author hopes will be brought out by other experimenters. The author hopes to amplify later on this his preliminary report. EMIL C. ROBITSEK.

Crile, G. W.: Newer Conceptions of Intestinal Stasis. *Am. J. Ch.*, N. Y., 1915, LXII, 861.

The identity of the clinical picture of intestinal stasis with the symptoms produced by chronic infections and excessive exertion led the author to suspect that intestinal stasis might well be an etiological factor in certain diseases of which infection, excessive emotion, and excessive exertion are etiological factors—such as cardiovascular disease, exophthalmic goiter, diabetes, etc.

In an experimental research animals were given injections of indol and skatol, the typical products of intestinal stasis. Histological examination of the organs and tissues of these animals showed lesions in the brain, the adrenals, and the liver, identical with the lesions in these organs produced by stimulation of the kinetic system.

Chemical studies of the iodine content of the

thyroid and of the glycogen content of the muscles and the liver, gave further evidence of the increased activity of the kinetic organs in the presence of these products of intestinal stasis. In other words, after injections of indol and skatol, as after the application of other kinetic stimuli, increased functional activity of the organs of the kinetic system is evidenced, in the case of the brain by the loss of Nissl substance; in the thyroid by changes in the iodine content; in the liver by histological changes and by changes in the glycogen content; in the adrenals by histological changes and by increased functional activity, as evidenced by the Cannon test; in the muscles by progressive weakness and changes in the glycogen content.

The retention of faeces in the intestines, therefore, produces a continuous abnormal activation of the kinetic system from which there results morphologic and histologic changes in the energy transforming organs of the body. The author believes that this may result in premature "senility," defined by Metchnikoff as due to the absorption of intestinal poisons, or that, due to the long continued strain, some of the organs may become affected and one or more of the chronic diseases result.

As in every case of excessive kinetic activation, treatment must consist, first, in removing the local stimulus; and second, in repairing the damage sustained by other parts of the mechanism.

The author's procedure of choice is resection of the cæcum and ascending colon, making a lateral anastomosis between the ileum and the transverse colon near the hepatic flexure and buttressing the closed ends of the ileum and the transverse colon against each other to prevent dilatation of the ends.

Every patient of his series of 16 is still living. Some were wholly relieved; others only partially. The author considers that the entire question is still in the crucible and that judgment must still be suspended.

C. H. DAVIS.

Lahey, F. H.: Carcinoma of the Small Intestine. *Ann. Surg.*, Phila., 1915, LXII, 428.

The author gives a brief review of the literature and a full report of two additional cases of his own.

Vinot and Parcelier have collected 50 cases in all, the majority of which were reported from autopsies. The average age is 43.9 years and in practically all cases the tumor is more or less annular in form, infiltrating all coats of the bowel. The symptoms are vague and indefinite until some degree of obstruction occurs, or palpable tumor appears. Pain is one of the earliest symptoms and is probably due to the obstruction. Vomiting and constipation are two of the most prominent and constant symptoms.

The author's first case was a male, aged 41, whose previous history was good excepting fistula in ano 4 years previous; his habits were good and his venereal history negative. Six months before examination he began to be distressed in the stomach region after eating or drinking; he began to lose

strength, and to vomit occasionally after eating, which would relieve the distress. The bowels were constipated, and there was a slight loss of weight. He was well developed and well nourished; cachectic, with 70 per cent haemoglobin; liver and spleen not enlarged; abdominal area over and internal to the splenic flexure, tender with a hard, small, indefinite and freely movable mass present.

At operation, through a left rectus incision a small annular tumor was found about 18 inches from the ligament of Treitz and completely surrounding the bowel. About 18 inches of bowel with mesentery was resected and an end-to-end anastomosis done. A few mesenteric glands were removed. The recovery was uneventful and the pathological report was adenocarcinoma. Fourteen months later the patient reported that he was in excellent health and had gained 20 pounds.

The second case was a female, with a rheumatic history and menopause occurred at 42 years of age. For a month she had had colicky pains in the lower left abdominal region accompanied by distention and constipation. She had only vomited once in three months, had lost weight (115 to 98) and strength. Abdominal examination showed a movable, hard, irregular mass, the size of an egg to the left and slightly above the umbilicus. No tenderness. Urine negative. Benzidine blood test in feces positive.

At operation, through a median line incision a small discrete tumor of the small intestine was found six feet from the ileocaecal valve. The growth completely encircled the bowel and almost wholly occluded its lumen. There was no involvement of the liver or other organs. About 18 inches of bowel was resected and an end-to-end anastomosis was made. Recovery was uneventful but death followed five months later from recurrence. The pathological report was adenocarcinoma.

As to prognosis, with early diagnosis this type of cancer is one of the most favorable forms of intestinal cancer to operate upon. The early diagnosis will be aided by submitting those cases with suspicious intestinal symptoms to early X-ray examinations.

P. M. CHASE.

Handley, W. S.: Ileus Duplex (Inflammatory Enterocolic Ileus). *Brit. J. Surg.*, 1915, III, 101.

Handley discusses one of the numerous varieties of adynamic ileus which he terms "ileus duplex." Fourteen illustrative cases are reported.

Nature and causes:

Ileus duplex obstructs the intestine at two points, due to pelvic peritonitis: (1) at a point three feet from the ileocaecal valve, (2) at the junction of the iliac and pelvic portions of the sigmoid colon. This results in a paralysis of the portion of ileum lying in the pelvis, together with the lowest portion of the pelvic colon and the upper part of the rectum.

The causes are: (1) appendicitis, (2) gonorrhoeal or septic infection of the genital tract, (3) rupture of the bladder, (4) carcinoma of the rectum,

(5) septic conditions of genital organs or operations for their relief (Berkeley and Bonney).

The condition is likely to occur in cases where there is a septic bullet wound of the bladder, whether intestines are perforated or not, resulting in pelvic peritonitis and intestinal obstruction.

Appendicitis is the most frequent cause of ileus duplex, especially with the appendix in the pelvis. With a retrocaecal appendix, the pus may trickle down over the brim of the pelvis and thus give rise to a pelvic peritonitis. In the normally placed appendix, suppurative gives rise either to a local abscess or to a general abdominal peritonitis with secondary involvement of the pelvis.

The pelvic ileum shows evidence of acute inflammation; the peritoneal surface is dull, congested, covered with pus and lymph-flakes, and the bowel wall swollen and oedematous. The affected coils are empty, passively contracted with sharp angular kinks, and often adherent. These conditions extend to within two inches of the ileocaecal valve; the general abdominal cavity affording no evidence of peritonitis. There is, on the ileum, a sharp line of demarcation at the pelvic brim. Above this line, in early cases, distention is absent, but soon occurs, taking place from below upwards. A bacterial invasion follows and a general peritonitis results.

The large pelvic bowel, at the beginning, is unaffected, owing to its protection by the coils of ileum together with its remote position; but within a short time shares the inflammation and paralysis.

In many cases, a general peritonitis is found at autopsy, which obscures the true condition inasmuch as the general peritonitis follows the pelvic infection; and it may be that after death it will be impossible to determine which was the primary and which the secondary cause thereof.

The recognition of ileus duplex is a product of operating-room pathology, not dead house.

The clinical signs and symptoms are those of acute intestinal obstruction superposed on those of pelvic inflammation; i.e., almost constant vomiting, continued absence of flatus, moderate distention, no visible peristalsis, and slight, if any, abdominal rigidity.

Proof of the duplex character of the obstruction is the failure of treatment if directed solely to ileal obstruction. Lateral anastomosis of the ileum to the caecum is very successful in all cases, except in those of ileus of inflammatory origin. Two illustrative cases are cited of pelvic appendicitis with ileus duplex.

Handley believes that with the combined treatment of caecostomy and ileocolostomy the mortality will fall from 75 per cent to 20 per cent. He quotes a series of 13 cases in support of this view.

To prevent ileus duplex, careful examination of the pelvis in all cases of appendicitis is advised. If pus is found, drainage to the bottom of the rectovesical pouch is advised. Likewise, a careful examination of the pelvic ileum for paresis, and the suprapelvic ileum for distention.

As to treatment, Handley strongly advises ileocolostomy accompanied by caecostomy. It matters little whether the anastomosis is between the caecum and ileum or between the sigmoid and ileum, provided the large bowel is also drained. This latter is done by sewing a large catheter into the bowel, usually the caecum. This is removed at the end of five days.

Enterostomy is strongly condemned, in that it robs the patient of much of the nourishment and most of the fluids. Jejunostomy is considered to have only a limited application although Bonney strongly advocated it; chiefly in cases of paralytic obstruction following abdominal section, after severe vomiting has begun.

Ileus duplex is most frequently mistaken for general peritonitis, but, as Handley has shown, it is as a rule a prophesy and not a diagnosis. Observations on pelvic inflammatory cases in the operating room, not the mortuary, reveal marked evidences of obstruction preceding any signs of general peritonitis. While these two conditions present a close general resemblance, in the usual peritonitis general abdominal rigidity is present; in ileus duplex, it is absent. The diffuse abdominal tenderness of the first is not present in the latter; nor does the pulse, although rapid, show the same wavering quality as the pulse of peritonitis. The other symptoms of distention, vomiting, constipation, temperature, and embarrassed abdominal respiration are found in both.

P. M. CHASE.

Winslow, R.: The Diagnosis of Appendicitis in Early Typhoid Fever. *Ann. Surg., Phila.*, 1915, lxxi, 134.

Winslow directs attention especially to the question of the diagnosis of appendicitis in the early days of typhoid fever and to the question of operating in such cases. It is a very unfortunate occurrence to mistake a case of beginning typhoid fever, with abdominal pain, for appendicitis and to subject such a patient to an abdominal section.

The paper is based upon four cases occurring in the same hospital at almost the same time and treated by different surgeons. From the appearance of the appendix at the time of operation, and from the subsequent course of the cases, it is evident that unnecessary operations were done during the active period of a dangerous disease. Winslow raises the question whether this was the result of lack of knowledge on the part of the operators, or of negligence in the examination of the cases; or whether the difficulties in establishing a differential diagnosis are real and these mistakes excusable.

He believes that the leucocyte count is the most reliable diagnostic sign; it is usually low in typhoid fever and markedly increased in appendicitis, though at times there may be a low leucocyte count in serious and even fatal cases of appendicitis. He states that there is less muscular rigidity and tenderness in these typhoid cases than in cases of genuine appendicitis. Headache also is more com-

mon. The time of the year in which the cases occur should be considered. During months in which typhoid is prevalent, especial suspicion should be directed toward typhoid.

F. H. POOT.

Rosenow, E. C.: Pathogenesis of Spontaneous and Experimental Appendicitis, Ulcer of the Stomach, and Cholecystitis. *J. Indiana M. Ass.*, 1915, viii, 475.

The accepted view as to the usual avenue of infection whereby appendicitis, ulcer of the stomach, and cholecystitis occur is by means of surface infection from the lumen, or migration of bacteria through the lymphatics, even against the normal lymph stream.

The experiments of Rosenow tend to show that the common means of infection of these organs is by embolism from some distant focus of infection such as infected tonsils, pyorrhœal pockets, or the intestinal tract. His experiments consisted chiefly of the injections of streptococci of varying strains into animals. A selective property was demonstrated whereby an organism from an inflamed appendix would cause a similar lesion in the animal, one from a gall-bladder a similar lesion in the animal, etc. Other lesions occurred in the animals but with not such great frequency as the special one indicated.

J. H. SKILES.

Keefe, J. W.: The Surgery of the Appendix. *Am. J. Obst., N. Y.*, 1915, lxxi, 821.

This paper discusses the etiology, complications, and treatment of appendicitis, the author's great plea being for early diagnosis and operation. There are too many deaths due to appendicitis, and the author believes that ill-timed advice given by physicians is often the cause. He believes that the medical profession and the laity must be taught that castor oil or any other cathartic should never be given in the early stages of an attack of pain in the belly.

Appendicitis is a disease amenable to surgery. Early operation by a competent surgeon should be attended with no mortality. When we know this to be a fact and realize how easy it is to remove an appendix in the first twenty-four hours of the disease, it is regrettable to hear of so many dying of this disease because of delay. Both physicians and the laity are to blame. Make the diagnosis early. Advocate operation before the end of the first day and see to it that a man well qualified to do surgery performs the operation.

C. H. DAVIS.

Gibbon, J. H.: Typhoid Perforation. *Ann. Surg., Phila.*, 1915, lxxi, 539.

Gibbon states that the high mortality of typhoid perforation results not from the lack of knowledge regarding the symptoms, but from not acting promptly when the symptoms present themselves. The two most valuable symptoms are pain and rigidity, and on these two symptoms we must rely almost wholly. From a study of his cases, numbering 128, he believes that the mistake of attributing

the pain and rigidity of a thoracic lesion to a perforated ulcer is unlikely, but of course a careful examination of the chest should always be made. Sudden severe pain and board-like rigidity indicate a perforation of some size with considerable leakage, and the diagnosis is comparatively easy. The less sudden and less severe the pain and rigidity, the more difficult the diagnosis becomes. Digital examination per rectum should always be made and often will reveal acute tenderness, which is of great significance. Difficult, painful, or frequent urination often occurs. Changes in pulse-rate and temperature are of no great diagnostic value and a sudden fall of temperature with an increased pulse-rate often means hemorrhage.

The author's case reports do not show an extensive use of blood counts. He believes that the absence of a hyperleucocytosis is of no diagnostic value. As a rule, it takes from eight to twelve hours for the average case of perforation to develop a leucocytosis. The presence of a leucocytosis, of course, is of diagnostic value. He puts little faith in the presence or absence of liver dullness, but if the liver dullness is absent and the abdomen is flat, the probability is that perforation has taken place.

When the symptoms are sufficient to make a perforation probable, there should be no delay in operating. Delay after the onset of pain and rigidity is the cause of the high mortality following operations for perforation in typhoid fever. Quick exploration does little harm, even where no perforation is present.

The frequent development of lung complications after these operations shows that the duration of anaesthesia should be as brief as possible. The safest rule is to open the abdomen under infiltration anaesthesia and administer a general anaesthetic only if it is absolutely necessary, and then for as brief a time as possible, 10 or 15 minutes should suffice.

The question of how the perforation itself should be treated is still a matter of controversy. In the cases reported by Gibbon closure of the perforation with drainage of the abdomen has been the rule, but in a number of cases the perforated bowel has been sutured in the wound and allowed to drain. Hays of Pittsburgh advocates very strongly the performance of enterostomy, and his personal statistics bear out the value of this method.

Gibbon does not approve of irrigation. The Fowler position is not always advisable as the patient is often too weak to stand it. E. H. POOL.

Riedel: Surgical Complications of Typhoid (*Chirurgisches ueber Typhus*). *Mitt. d. d. Grenzgeb. d. Med. u. Chir.*, 1915, xxviii, 749.

Riedel has had occasion to operate on 40 patients for surgical complications of typhoid and publishes his experience in the hope that it may be useful in the numerous cases of this kind that will probably appear after the war. The most serious complication of typhoid is suppurative peritonitis, either from perforation of an ulcer or from diapedesis.

Recent publications on the subject show that comparatively good results can often be obtained by early operation. Armstrong operated on 78 cases with 24 recoveries; Flocken reports 56 with 12 recoveries, or 21.4 per cent; Watson saved 5 cases out of 27; Michaux had between 7 and 8 per cent recoveries in 150 cases.

One of Riedel's cases was in a boy of 14 who had had an appendectomy performed seven months before. He suddenly developed symptoms of peritonitis which were attributed to the appendix operation. Operation was performed but no reason could be found for the peritonitis. On autopsy typhoid ulcers were found in the intestine, but the serosa above them was intact. Typhoid had never been suspected. It is probable that many cases of so-called spontaneous peritonitis are due to unsuspected typhoid. Two cases of typhoid typhilitis are reported, and reference made to the work of Thomas and Frazier who had 8 cases of suppuration of mesenteric glands in typhoid. One patient had multiple typhoid fistulae of the anus, which were so extensive and severe that they did not recover after repeated operations. The patient left the hospital uncured. A woman of 57 was operated on for peritonitis which was assumed to be due to typhoid, as the Widal was positive. On autopsy no ulcers were found in the intestines, but the contents of the gall-bladder showed typhoid bacilli. A man of 34 had suppurating thrombophlebitis of the internal saphenous vein. The vein was extirpated and he recovered. This is unusual, as no similar cases had been reported in the literature up to 1908. Another patient of 22 had typhoid thrombosis of the femoral vein, and four years later thrombophlebitis of the external saphenous. The vein was extirpated but the patient continued to have fever for weeks and was discharged with a badly swollen leg. Two cases of typhoid abscess of the abdominal wall, one gluteal abscess and one of the kidney are reported.

Among 23 cases of typhoid processes in the bones, 11 were in the costal cartilages, 6 in the tibia, 2 in the femur, 2 in the pelvis, and 1 each in the sternum and radius. The results are generally good after resection. It is often not necessary to operate in cases of typhoid involvement of the costal cartilages, for they frequently recover spontaneously, even after a long time. If they are not infected it is best to let them alone; but if they are infected operation must be extremely radical. Joint involvement may develop a long time after the typhoid. In one of the author's cases an osteomyelitis of the hip developed twelve years after typhoid but recovered after resection. In a boy of 16 puncture of the hip-joint showed typhoid bacilli. The joint was drained and he recovered. The author had two cases of arthritis deformans developing after typhoid.

He concludes that typhoid complications in the soft parts are the most dangerous, and the only hope offered is by early operation. Peritonitis from diapedesis offers a worse prognosis than that

from perforation. The prognosis is quite good in typhoid appendicitis and still better in typhoid cholecystitis. Bone tissue seems to have unlimited capacity for regeneration, so that typhoid foci in bone are not at all dangerous unless they occur in especially unfavorable locations. The prognosis in joint complications is good if they are operated upon early.

A. Goss.

Greig, D. M.: A Case of Congenital Desmoid Tumor of the Rectus Sheath in an Infant.
Edinb. M. J., 1915, IV, 343.

A desmoid tumor was removed from the sheath of the rectus abdominis in a female child 18 months of age. The child had had no illness, but was said to have had a swelling in one groin, which was supposed to be a hernia noticed soon after birth, but which gave no evidence of its presence when she came under the author's observation. The tumor in the abdominal wall was noticed when the child was about eight months of age and it had slightly increased in size. It was situated to the right and a little above the umbilicus and formed a round, flattened, densely hard tumor, almost an inch in diameter. The tumor had always remained hard, had never been reducible, and never varied during straining. The tumor appeared to be within the sheath of the right rectus.

Under an anæsthetic the tumor was felt to be cartilaginous and could be lifted up as a flattened sphere, obviously in the abdominal wall. The skin was incised transversely and the anterior sheath of the rectus longitudinally. The muscular fibers appeared to be incorporated with the margins of the tumor and were dissected off with difficulty. The tumor was then found to be firmly fused with the anterior and posterior layers of the rectus sheath at one of the tendinous intersections and some trouble was experienced in separating the anterior, while in removing the tumor from the posterior layer part of the sheath had to be sacrificed, together with the subadjacent peritoneum, and the wound drawn together with catgut sutures. The child made an uninterrupted recovery.

EDWARD L. CORNELL.

Barnes, R. H.: Cause of Dissatisfaction with Hemorrhoidal Operations. *Practitioner*, 1915, 13, 147.

Barnes contends that dissatisfaction with hemorrhoidal operations is due to the fact that most surgical procedures now in vogue are essentially unsurgical. The ligature method results in a stump which clings off, and patients on whom it is used suffer great pain. The clamp and cautery method is based on the same principles as the ligature; a slough is left, consequently there is danger of secondary hemorrhage.

The Whitehead operation is mutilating and should be used only when the removal of hemorrhoids would not leave sufficient mucosa in the anal canal. The excision of the hemorrhoid by clean-cut incision leaving an elliptical longitudinal wound

(after the method of Pennington) is the procedure of choice. Hemorrhage can be controlled at operation, and as no slough remains there is no danger from secondary hemorrhage. Rough dilation of the sphincter is one cause of post-operative pain; unnecessary crushing of tissues not removed is another factor. The resultant edema and mild infection add to the discomfort of the patient. Distress from gas accumulations is best relieved by frequent cold water enemata, beginning 24 hours after operation.

S. TOMPKINS.

LIVER, PANCREAS, AND SPLEEN

Carman, R. D.: Roentgen Observation of the Gall-Bladder and Hepatic Ducts After Perforation into the Duodenum. *J. Am. M. Ass.*, 1915, LXV, 1812.

The roentgenologic demonstration of a barium-filled gall-bladder which Carman reports is, he believes, unique in the literature.

The patient in the case had an operation performed sometime before for gall-stones. At the roentgen examination made to investigate discharging sinuses from the old operation scar, no retention of the 6-hour meal was found. Subsequently far up in the right abdominal quadrant was a dense collection of barium with springlike branches. This was believed to be the gall-bladder, indicating a communication between it and the upper intestinal tract. At operation the fundus of the gall-bladder was found to communicate with the duodenum through a perforation.

HOLLIS E. POTTER.

Feldmann, L.: Bacteriology of Cholecystitis (Beiträge zur Bakteriologie der Gallenblauentzündungen). *Wien. klin. Wochenschr.*, 1915, LVIII, 1392.

During the past eight and one-half years Feldmann has had occasion to perform autopsies on a considerable number of cases where death had resulted from typhoid fever, and in all of the cases in which death occurred during the course of the typhoid, typhoid bacilli were found in the gall-bladder, even in cases where they could no longer be cultivated from the spleen. During this time he also examined the gall-bladders removed in 28 cases of cholelithiasis; in 16 of the cases the contents of the gall-bladder was purulent, and in 5 typhoid bacilli could be cultivated from the pus.

Reference is made to a case published by O. Mayer of an 18-year-old youth who was a typhoid carrier, and who began to suffer from symptoms of gall-stones after his recovery from typhoid. On operation a pure culture of typhoid bacilli was obtained from the contents of the gall-bladder. If the assumption is correct that gall-stones are frequently caused by typhoid bacilli a great increase in the number of gall-stone cases should be expected after the war, because so many of the soldiers are infected with typhoid.

A. Goss.

Gwathmey, L.: *Surgical Treatment of Diseases of the Biliary Tract*. *Virg. M. Semi-Month.*, 1915, II, 402.

Early operation has happily resulted in a much lowered mortality and morbidity, incidentally adding years and happiness to both the patients and the surgeons.

Experience has further demonstrated the failure of permanent relief in many cases in which certain surgical measures were executed with temporary improvement, resulting in secondary operations which are trying to the patient and often difficult for the surgeon. For the elimination of these second operations, a proper understanding of the pathology in relation to the symptomatology is essential in the first instance. On the other hand, a failure to co-ordinate the surgical measures to the resisting powers of the patient and, in severe cases, limiting operations to the immediate necessities, even though it may leave the patient subject to the likelihood of a second operation, will result in a greatly increased immediate mortality and but a slightly decreased morbidity. The latter statement would seem inappropriate without the qualifying addition of the probable wound infection, prolonged drainage, hernia, etc., resulting from the depleted state of the patient and the advanced organic changes, both local and remote. Emphasis is repeatedly laid by writers and prolific operators, like Robson and Deaver, on the frequently unforeseen difficulties of operation in this field and the necessity for adequate equipment, assistance, surgical skill, experience, and resourcefulness.

In repeated mild attacks, the opportunity of an attack may be seized for removal of the appendix and removal or drainage of the gall-bladder. In the moderate but more severe cases there is much difference of opinion, one school waiting for a subsidence of inflammation and the other advocating immediate operation. The middle ground seems best, e.g., if seen early, operate; if the inflammation is waning, wait.

In the very acute or fulminating cases of empyema, rupture, or gangrene of the gall-bladder or suppurative inflammation of the ducts, immediate interference is demanded, anticipating, if possible, intrahepatic or extraneous abscess, crippling adhesions, puncture of the stomach, duodenum, or colon or a rapidly advancing and fatal peritonitis. These patients are often very ill and the surgical interference is best limited to the essential relief of the pressing trouble, leaving extensive or time-consuming measures to the future. It is here that one displays the best surgical skill and judgment, or the worst; the difference commonly resulting in success on the one hand or disaster on the other.

That gall-bladder drainage has served well, that it clears up inflammation of the ducts and of the pancreas, if continued long enough, can scarcely be doubted, and even when a diseased gall-bladder is left for future attention because its removal might prove too hazardous, often by drainage the inflam-

mation disappears and no further intervention is needed. Cholecystectomy is distinctly, under any and all circumstances, a more serious operation than simple drainage. It has its very clear indications, which are being gradually enlarged and definitely indicated.

For a discussion of the many incisions employed and their relative merits, reference is made to the work of Deaver and Ashhurst. It is well to bear in mind that upper abdominal incisions do not heal as promptly nor as securely as those in the lower abdomen. These wounds need good support and suturing for rather a longer time than is sometimes practiced. Too much emphasis cannot be laid on the importance of gentle handling of tissues.

Cholecystotomy must have a very limited application.

Cholecystostomy is the operation of choice in simple cholelithiasis with patulous ducts, in simple inflammation with associated pancreatic involvement, and in the face of severe inflammation in obese subjects where the urgency of the acute illness on the one hand, the technical difficulty on the other, or a combination of the conditions make it the most expedient course.

The inversion of a cuff of the gall-bladder with firm closure around the dressed tube obviates suture of the gall-bladder to the abdominal wall and is thus often preventive of a dragging sensation and subsequent discomfort.

Cholecystectomy is usually best performed from within outward. It consists in clamping and ligation of the cystic duct and artery and removal of the gall-bladder with closure of the bare space on the under surface of the liver as the organ is removed. Where the tissues are not infiltrated, the stump is closed over with redundant peritoneum, very much after the method commonly employed after appendectomy. This tends to prevent objectionable adhesions which may later cause symptoms; and, in furtherance of this latter object, the interposition of omentum or loose peritoneal fat between the stomach, duodenum, and the gall-bladder bed is strongly indicated, particularly in case the common duct is drained at the time.

Cholecystenterostomy may have a definite indication in complete stricture of the common duct in case of persistent biliary fistula and in the very dense, hard condition occasionally seen in pancreatitis.

EDWARD L. CORNELL.

Scudder, C. L.: *A Report upon One Case of Splenectomy*. *Ann. Surg.*, Phila., 1915, III, 530.

Scudder reports a case of splenectomy for splenic anemia followed by resection of intestine for mesenteric thrombosis.

The patient was a poorly nourished Russian boy, 18 years of age, who had had for 10 years at intervals bleeding from the nose and mouth and ecchymotic spots over the body. The skin presented a bluish tint, was dry and harsh, and showed minute ecchymotic areas, bluish black in color. The spleen

extended 14 cm. below the costal margin in the nipple line. The Wassermann test was negative, white cells, 8,000; hemoglobin, 33 per cent; red cells, 2,980,000. Two transfusions of blood brought the hemoglobin up to 55 per cent.

The spleen was removed with practically no loss of blood; it measured 12 by 11 by 6 cm. Beginning a week after the operation, the patient gradually developed intestinal obstruction. Craniotomy dis-

closed a gangrenous ileum due to mesenteric thrombosis. The diseased bowel was removed, an end-to-end anastomosis being made. The patient died the afternoon following the operation. No autopsy was performed.

Interest centers in the fact that following a properly conducted splenectomy a thrombosis occurred in a vascular system not directly connected with the vascular system of the spleen. E. H. POOL.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS. CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Beedle, G. A.: Reviewing the Subject of Bone Regeneration. *J. Ma. St. M. Ass.*, 1915, XII, 490.

The theories of bone regeneration are represented by two extreme groups: one maintaining that new bone comes entirely from periosteum, and the other believing that periosteum is only a limiting membrane, the regeneration coming from bone itself, or, in case of stripped periosteum, from osteoblasts clinging to the periosteum. Likewise in cases of bone-graft, some contend that the grafted bone is retained without change, while others state that the graft is not osteogenic but osteoconductive.

The author believes that the periosteum cannot generate bone if it consists only of its two coats, the fibrous and fibro-elastic layers; and that the alleged osteogenesis occurs only when part of the cortex is really left along with the periosteum. The life of the graft depends upon the maintenance of adequate circulation, and under such conditions the graft is not necessarily replaced.

In open work on fractures, the sliding bone-graft taken from one segment to be embedded in a groove of the second is preferable to the inlaying of the section from another bone. Bone-plugs may be used to hold the graft snugly. He cites two cases: (1) a simple fracture with non-union in which he used the sliding graft; and (2) a badly comminuted fracture in which he used splintered fragments as autogenous grafts. Both results were excellent.

R. G. PACKARD.

Jefferson, G.: A Case of Paget's Disease (Osteitis Deformans); a Note upon the Pathology. *Brit. J. Surg.*, 1915, III, 219.

Up to 1910 Ellis collected approximately 158 reported cases. Jefferson's patient was a male aged 67. He noticed his legs were bent and that he was growing weaker. His head was sunk upon the chest; the spine was generally curved, and the legs bowed out so that with the feet approximated there was a gap of one foot between the medial femoral condyles.

Briefly stated the changes in the skeleton induced by this disease may be said to be of a static

nature, owing to the general softening of the bones, which is the chief feature of the earlier stages of the affection. Thus all the bony curves come to be exaggerated, and later a new deposit of bone beneath the periosteum, and sometimes in the medullary cavity, leads to a considerable thickening of the bones. In this case there had been a shortening of three and one-third inches in the patient's height, and he was obliged to wear a No. 7½ hat instead of a 6½. There was a fixation of the chest in the expiratory position. Arterial calcification was present to an extraordinary degree.

The earliest of the changes in the bones which occur in this affection is softening, which leads to certain static changes, even in the bones of the cranium. Subsequent osteoid deposit only serves to make these deformities permanent. This decalcification must affect the whole length of the bones more or less impartially, as the bendings are general and regular. The deposit of new bone seems to occur very early, since the patients describe the thickening as synchronous with the curvatures. It is not always quite exact to say that the bones are thickened; it is nearer correct to say that they are widened.

Paget's disease is in all probability not an inflammation, but a disturbance of the internal secretions (especially thyro-parathyroid) which control the calcium exchange of the body.

The early stages of the disease are characterized by a general decalcification, bringing the affection into line with osteomyelitis fibrosa and to a limited extent with osteomalacia. At the same time an irregular bony proliferation occurs, sufficient in amount to overshadow in the urinary and intestinal excretion the absorbed bone salts.

The disease may progress along different lines, presenting itself as an osteomyelitis fibrosa or having excessive lime deposits, the average being the mean between these two. Although a general disease, certain bones are more severely affected than others.

The disease may be impossible of diagnosis while a single bone is affected, though the X-rays will often reveal disease in the early stages in other bones where it had not been thought to exist.

Later, bone salts are deposited in large amounts, this stage being associated with calcium magnesium and phosphorus retention, as has been proved.

During the stage of softening, which may be prolonged and gradual, deformities are produced in all the bones, including the skull.

The several varieties of bone changes which have been described by various observers of this disease may be explained by the morphological differences which the bones present at different stages of the malady, and the different forms—the fibrous or the osseous tissue predominating—which it may assume.

Benefit may be looked for from the oral administration of extracts of the glands of internal secretion, although once deformities have occurred they will persist even if the disease is arrested.

PHILIP LEWIN.

Belot, J., Nahan, and Chavasse, A.: Radiotherapy of Bone and Joint Tuberculosis, Especially Spina Ventosa (*Le traitement radiothérapique des tuberculoses ostéo-articulaires en particulier des spina-ventosa tuberculeux*). *J. de radiol.*, 1915, 1, 641.

The authors have treated a number of cases of bone tuberculosis with roentgentherapy and have taken radiographs during the course of recovery, some of which are reproduced. Their cases were mostly spina ventosa of the limbs in children.

Children react more quickly to the rays than adults, but radiotherapy has been found of value even in adults. It is particularly indicated in closed, non-suppurating cases, just the ones in which surgery is not indicated. Even suppurating cases, however, improve under radiotherapy. It was formerly feared that the rays might cause atrophy of the cartilages, but this has never been observed, except in severe cases where the disease itself has produced it.

The rays are applied over several different fields so as to get the maximum deep effect with the least injury to the skin. In closed cases the swelling begins to abate after the second treatment; pain, when it exists, disappears quickly and joint function rapidly improves, not because of the action of the rays on the joint itself, but because they reduce the congestion and infiltration of the surrounding soft parts. Generally after 10 to 15 treatments clinical recovery is complete. Improvement of course is much slower in the suppurating cases. The general condition improves, and it has been suggested that irradiation of the arms and legs of the patient with small doses of the roentgen rays would help to increase the general defensive power of the body. Details of 7 cases are given.

A. GOSS.

Kocher, T., Stoller, H., Huber, O., Garnier, P., and Schlittowsky, M.: Comparison of Old and New Methods of Treatment of Bone and Joint Tuberculosis (*Vergleich alterer und neuerer Behandlungsmethoden von Knochen- und Gelenktuberkulose*). *Deutsche Ztschr. f. Chir.*, 1915, cxxxiv, 1, 34, 113, 195, 242.

These articles can all be discussed together, because they all deal with the same subject, the

results of operative treatment of bone and joint tuberculosis as compared with the more recent heliotherapy, which the authors all believe has been accepted with too great enthusiasm by its advocates, and which they wish to place in a truer light.

In the first article Kocher gives a general discussion of the subject and statistics with reference to the different forms of bone and joint tuberculosis observed in his clinic in recent years. The following articles by his students discuss more in detail tuberculosis of the individual joints.

As the first point in his argument against the exaggerated value of heliotherapy Kocher points out that Rollier, besides the heliotherapy, made very extensive use of orthopedic treatment, and that a part at least of his good results are to be attributed to this. Rollier was assistant in Kocher's clinic for four years and has since put to excellent use what he learned there, as a supplement to his heliotherapy. Kocher does not dispute Rollier's theories as to the cause of the good results of heliotherapy, effect of ultraviolet rays, pigment formation, etc., but he believes an open-air treatment carried out day and night, according to Halsted's method, would give the same results as Rollier's heliotherapy. With reference to other methods of treatment, such as brine baths, Koenig's quartz lamp, roentgen rays, tuberculin treatment, Bier's hyperæmia, iodine and phenol treatment, Kocher agrees with Arndt that they are not to be compared with heliotherapy. But the drawback of heliotherapy treatment, which even its most ardent advocates cannot dispute, is its long duration and the great amount of time and money that it takes to stay for years at a mountain sanitarium. This excludes all but the wealthy classes. But even then it is not justifiable to treat bone and joint tuberculosis with a purely expectant and hygienic treatment. Radical local treatment, if performed under proper indications and with the proper technique, cannot be supplanted by any other method of treatment, and when the physician by the removal of a tubercular focus or sequestra can within a few weeks bring about recovery in a condition that would otherwise incapacitate the patient for years, it is manifestly his duty to operate. There may be danger in operation if other organs are involved, especially in children, in old people, in neglected cases or where other infections coexist, for instance with pus cocci or colon bacilli. Under these circumstances free air and sunshine treatment is indicated, in combination with orthopedic measures, and even then only until favorable conditions are re-established for operation. In patients for whom it is impossible to spend as much time and money as is required by heliotherapy, radical operation is certainly indicated, consisting of total excision of bones, total resection of joints, or even atypical operations, which however must always totally remove the local tubercular focus.

The indications are quite different in the different bones and joints. Kocher gives pictures of the different forms of local disease. One point of in-

terest is the decrease in the number of cases coming to his clinic in recent years, especially of hip and knee tuberculosis. This is to be attributed in part to the increasing number of hospitals with competent operators, but also in part to the increasing profligation for conservative methods of treatment. His conclusions with reference to the different forms of the disease are as follows:

1. *Spondylitis*. There is no question that these cases should be given open-air and sunshine treatment, combined with the proper orthopedic treatment and that they should be kept in bed. Aside from puncture and aspiration and the injection of iodoform glycerine injections in burrowing abscesses no surgical intervention is indicated.

2. *Shoulder-joint*. Köcher believes, with Koenig and Garré, that arthrotomy and resection are indicated, combined with general treatment and correct after-treatment.

3. *Elbow-joint*. In view of the 10 to 25 per cent of deaths which eventually occur from this condition there can be no doubt that this form of tuberculosis is very frequently complicated by tuberculosis of other organs and that therefore general treatment is indicated. But if it is impossible for the patient to carry this out for a long time, then resection should be performed, as the operation is without danger and the results of operative treatment are much better than those of general treatment without heliotherapy. The strictest asepsis should prevail during the operation and permanent antiseptics be maintained by the use of iodoform.

4. *Wrist-joint*. There is scarcely any other joint where the excellent results of operation are better illustrated, and where total resection may be proposed without any hesitation. Partial resections are justified only for special indications, such as necroses, abscesses, etc., where the process is circumscribed.

5. *Tubercular coxitis*. The ideal treatment for this is years of fresh-air treatment, either in the mountains, the lowlands, or the sea-coast, combined with orthopedic treatment. But for people who cannot afford this treatment operation is indicated.

6. *Tubercular gonitis*. Operation, especially radical resection of the knee joint, gives as good results as years of heliotherapy. The cure takes not more than six weeks, while heliotherapy takes months or years. There is this difference, however, that the latter may leave a mobile joint, while operation leaves ankylosis.

7. *Tuberculosis of the foot*. Radical operation gives the best results. Partial operations give rise to many recurrences and often render later amputation necessary. The functional results of operation are very satisfactory. Generally the function of the ankle is restored in a comparatively short time, though perhaps not so completely as it is in favorable early cases by very long continued heliotherapy.

Of particular interest is Köcher's comparison of his operative results with those of Garré. Köcher

operated more radically on the wrist, Garré on the ankle. Köcher got better results in the wrist, Garré in the ankle. Köcher agrees in general with Garré and Arndt, except that they think less of operation in coxitis than he does.

In the other articles by Köcher's associates there are presented more complete statistics with reference to the individual forms of joint tuberculosis. Many case histories and bibliographies are given.

A. Goss.

Gangolphe, M.: Gunshot Injuries of Bones and Joints (*Lésions osseuses et articulaires par armes à feu*). *Lyon chir.*, 1915, 10, 441.

Gangolphe gives the details of treatment of different joints. His general conclusion from his work as head of a military hospital is that the thing of paramount importance in the treatment of such injuries is absolute immobilization. Before the war he was rather inclined to surgical intervention, but now he rarely resects and only amputates when the patient's life demands it. Rifle bullets should be left alone, as they are rarely infected, and probing for them is more apt to carry infection than to do any good. Injuries with shrapnel and shell are generally infected, and free opening up and disinfection of the wound is indicated. On opening up such wounds he has often found signs of diffuse phlegmon and after incision pain stopped and the temperature fell to normal. After free incision and drainage the treatment should consist of frequent and prolonged local baths with antiseptic solutions. Moist dressings are very bad as they do not accomplish the purpose intended and they macerate the skin.

While appreciating the value of radiography Gangolphe believes that it sometimes does harm, because the sight of projectiles or bone fragments may lead the surgeon to think operation necessary, when immediate disinfection and absolute immobilization would have served the purpose better. He also gives a warning against the puncture of joints that are suspected of being infected. He finds plaster casts the best means of immobilization. The chief value of resection is that it furthers drainage. The benefits attributed to it by those who practice it are due rather to the free incision and drainage that accompany it than to the removal of the articular surfaces.

A. Goss.

Graff: Mobilization of Ankylosed Joints (*Zur Mobilisierung versteifter Gelenke*). *Deutsche med. Wochenschr.*, 1915, 41, 1502.

The author in discussing the causes of stiffening of the joints after injuries gives an urgent warning against the too prolonged immobilization of joints that are not directly injured. Every time the dressings are changed the joints should be carefully moved, and if there is no injury of the bone it should be possible for the patient to make slight movements inside the dressings; this is particularly important in the finger joints, for the metacarpo-

phalangeal joints are especially sensitive. Stiffness of the joint may be caused not only by injury of the joint itself, but by extensive injuries of the soft parts; injuries of muscle and tendons may cause stiffness by cicatricial contractures, and contraction of the capsule may bring about atrophy of the joint.

In treatment the first thing to be determined is whether the ankylosis is fibrous or bony. If the former it may be broken by force, but this is seldom effective and if great force is used it may cause hemorrhage that makes the condition worse. Improvement is obtained more slowly but more surely by the use of active and passive movements, baths, brine, mud and hot air baths, and mechanical measures.

In bony ankylosis the only treatment is operative ankylosis. Graff discusses the history of this operation, its indications and prognosis, warning against performing it too soon after infection. He describes a case of bony ankylosis of the elbow-joint with operation and interposition of muscle and fascia, chiefly from the triceps, in which almost complete restoration to normal was accomplished. This operation should be very valuable in war injuries.

A. Goss.

Payr: Joint Injuries and Suppurations and Their Treatment (Gelenkverletzungen, Gelenkeiterungen und ihre Behandlung). *München. med. Wchnschr.*, 1915, xlii, 1241, 1282, 1321.

A distinction should be made between the benign superficial suppurations, rich in exudates, which Payr calls empyema, and the malignant capsular phlegmons, which involve all the soft parts and deep tissues and constitute panarthrititis. In the latter, necroses and abscesses in and under the synovial membrane lead to perforations of the capsule and finally to para-articular phlegmons and abscesses.

The great majority of capsule phlegmons are not primary, but arise secondarily from empyema. To prevent their development is the most important part of treatment. The tendon-sheaths and bursæ lying near the joint are anatomical points where the pus is apt to break through. Abscesses may extend along the tendon-sheaths and through the loose intermuscular connective tissue till they reach a great distance from the suppurating joint. Many joint infections arise from the penetration of small fragments of bullets through the capsule, so small that they are not noticed at first. The foreign body abscess that forms around them may not manifest itself till some days after the major joint injury has apparently recovered. Even after incision and drainage of the joint such a focus of infection may lead to repeated re-infection and very severe capsule phlegmon; it should always therefore be removed. Fragments of projectiles in the body of the joint or in the capsule furnish such foci of infection, as do also suppurative gunshot fractures near the joint, as fissures may extend into the joint.

Besides removing the focus of infection provision should be made for draining away the exudate for some time. In empyema small incisions are sometimes sufficient, but in severe cases there should be drainage for a time with glass tubes. After emptying out the cavity of the capsule it should be filled with an antiseptic fluid, in order to keep it distended and prevent adhesion. From fibrinous adhesions and swelling of the synovia danger arises, even in opened joints, of local rise of pressure in the exudate and the transformation of a superficial into a deep suppuration. To prevent this the capsule should be filled and the joint cavity closed as quickly as possible. Hinge joints show the peculiarity of often having the infection limited to one side, the body of the joint forming a wall against the extension of the infection to the other side.

Care should be exercised to make the incision on the side that is primarily infected; otherwise the infection may be disseminated to the sound side of the joint. If severe infection demands long-continued drainage, the drainage should be backward in the shoulder, knee, and hip, to insure the freest discharge of the secretion. In severe capsule phlegmons if this treatment is not sufficient, the joint should be laid open, severing important ligaments and tendons temporarily. Infections that have become chronic, especially in ball and socket joints, frequently demand late resection. Primary resection is seldom indicated. Almost all the large joints have points at which capsule perforation and extension of suppuration is apt to take place and a careful study of their topographical anatomy is necessary for effective treatment. With such knowledge severe complications can often be prevented.

Except in the cases of extensive crushing and destruction of tissue and in primary gas phlegmon the ultimate aim of all treatment should be the re-establishment of function. With careful treatment this can be attained even in very severe cases. The fear of early movement, especially in empyema, is very much exaggerated, and functional after treatment is apt to be delayed too long. To be effective it should be begun early.

A. Goss.

Higgins, W. H.: Luetic Arthropathies. *Am. J. M. Sc.*, 1915, cl, 733.

Joint syphilis is much more common than American textbooks would indicate; Schuller states that 7 per cent of all joint diseases in children are specific.

The author cites two joint cases: one closely simulating acute rheumatic fever in its history, mode of onset, and general symptomatology; the other a chronic polyarticular involvement with rigidity, swelling, and tenderness. Each gave a positive Wassermann, and each cleared up on antisiphilitic treatment.

Higgins makes the following tabulation:

1. Congenital syphilitic lesions:
- a. Osteochondritis syphilitica, usually not involving the joint itself.

b. Simple synovial effusion, occurring mostly in children, usually painless, and not impairing motion.

c. Deforming arthropathy, usually due to osteophytic outgrowths from epiphyses causing ankylosis.

2. Acquired syphilitic lesions.

a. Arthralgia, frequently decreased rather than increased by motion, and showing no definite pathology.

b. Acute synovitis generally accompanied by pain.

c. Hydrarthrosis, slow in onset, painless, not impairing motion, and most often affecting the knee.

d. Infections of bursa, usually of those unconnected with joints, the joints themselves being free from involvement. There is little or no disability.

3. Late syphilitic lesions.

a. Gummatous arthritis, originating in extra-capsular osseous.

b. Gummatous osteo arthritis, simulating arthritis deformans.

c. Acute or chronic synovitis, showing more or less painful, intermittent effusion into the joint, and capsule thickening.

d. Charcot joint.

The author offers no differential diagnosis.

R. G. PACKARD.

Kleinberg, S.: Subdeltoid Bursitis. Med. Rev., 1915, LXVIII, 879.

The author reviews the anatomy, etiology, and pathology of this interesting condition. He takes exception to a statement recently made by Bricker that no case in which lime deposits in the bursa were demonstrated by X-ray was relieved except by operation. From his experience the presence of calcareous deposit does not preclude complete relief under non-operative methods. The most reliable symptom is limitation of abduction and rotation.

The author has found treatment by immobilization in extreme abduction very impracticable. Instead of this in the acute stage he immobilizes with adhesive plaster or plaster of Paris with the arm in the position in which it is found. In more chronic cases he resorts to frequent stretching and proper exercises. When the adhesions are of long standing or in order to shorten the period of convalescence he advises the excision of part of the bursa.

G. I. BARMAN.

Borchers, E.: Caution Necessary in the Use of Oxygen in Treating Gas Phlegmon. (Vorsicht bei der Sauerstoffbehandlung der Gasphlegmone). Muenchen med. Wochenschr., 1915, LVII, 1318.

Borchers thinks there is considerable danger in the use of oxygen in the treatment of gas phlegmon. He reports three cases in which he used it with apparently good results, but in a fourth case the patient died on the operating table and the large vessels and the right heart were found distended with gas. Experimental work has also shown that large amounts of the gas may collect in the right heart. Four other fatal cases besides the author's

have been reported and he thinks that others have doubtless occurred. In view of the fact that the use of oxygen is dangerous and that the results of purely surgical treatment are quite satisfactory he advises giving up the use of oxygen. A. Goss.

FRACTURES AND DISLOCATIONS

Wachtel, H.: Value in Diagnosis and Treatment of the Finer Details of the Roentgen Picture of Fractures. (Über die diagnostische und therapeutische Bedeutung der feineren Details der Frakturbilder). Muenchen med. Wochenschr., 1915, LVII, 1361.

The various steps in the healing of a fracture can be followed in the roentgen picture, and any pathological processes that develop may be detected. The first appearance of callus is in the form of irregular, structureless, whitish masses. Gradually these coalesce and connect the fractured ends of the bone and extend out into the soft parts so that the whole gap in the bone is filled in and the ends of the bone and any fragments contained in the callus disappear in the general shadow of the callus. Finally from the callus develops the usual bone structure. When the first whitish spots begin to appear, simple reduction can still be performed, but after definite bone structure is shown any reposition must be operative. If as the callus shadow develops fragments of bone can clearly be seen in it, thus indicating that these fragments are not incorporated in the callus but that there is suppuration around them, incision and evacuation of the pus are indicated. Often a bridge of callus forms across the gap so as to make the bone capable of function, but the picture still shows fragments to one side of the bridge, which should be removed. There may be a post-traumatic osteomyelitis shown in the picture, and in that event the osteomyelitis and not the fracture needs treatment. A. Goss.

Schreyer: Treatment of Fractures of the Humerus (Behandlung von Oberarmfrakturen). Deutsche med. Wochenschr., 1915, LI, 1394.

Schreyer points out that during the course of the war the treatment of fractures of the humerus at the reserve hospital has changed somewhat. The basic principle, extension with permanent traction, has remained the same. But at first the traction was applied with the arm extended, so that there was traction on both flexor and extensor sides of the forearm; now the extension is applied only to the upper arm. Even when there is very extensive injury of the soft parts there is generally enough normal space left to apply the extension strips. Adhesive plaster strips are generally applied to the outer and inner sides of the upper arm and fixed by a few turns of a bandage around them. The arm is laid on a table placed beside the bed so that the axis of the arm and that of the body form almost a right angle. This prevents stiffening of the shoulder joint while the arm is lying idle.

Systematic passive movement must be carried out, either by the physician himself on his visits or when the dressings are being changed. They can be begun a few days after the injury. The arm is seized above the condyles and by traction on it, aided by countertraction by the patient himself, the fractured bone is held at rest. The shoulder and elbow joint can be carefully exercised. By carrying out these exercises twice a day even a slight degree of stiffening can generally be avoided. The patient himself can exercise the wrist and finger joints and practice pronation and supination, for the forearm is not splinted. Passive movements of course are only carried on until consolidation takes place; after that active movements are more effective. Schreyer described eight cases showing the excellent results of this method of treatment.

A. Goss.

Steinke, C. R.: Fractures of the Femur. *Ann. Surg., Phila.*, 1915, lxi, 610.

A report of 63 traceable cases of fracture of the femur treated at the Episcopal Hospital from 1905 to 1915 shows that fractures of the neck were more frequent in the aged of the female sex, with a moderate disability period; fractures through the trochanter all occurred in males, with a long disability period; all fractures of the lower end were in males, with an average disability of six months; fractures of the shaft were most frequent, gave best results, had the shortest disability period, and occurred most frequently in the male sex.

JAMES R. MARTIN.

Hibbs, R. S.: Anteversion of the Neck of the Femur in Connection with Congenital Dislocation of the Hip. *J. Am. M. Ass.*, 1915, lxy, 1801.

In cases of congenital dislocation of the hip, where correction is made difficult or impossible on account of an anteversion of the head and neck of the femur, Hibbs advises an osteotomy at the lower third of the femur to correct the anteversion before attempting to correct the dislocation, and to replace the head of the femur in the acetabulum at a later time, when the anatomic conditions are more favorable, as a result of the osteotomy. He attributes many of the failures in the treatment of congenital dislocation of the hip to an anteversion that has not been recognized before operation. Cases are quoted and excellent results reported. The article is illustrated by radiographs and photographs.

A. J. DAVIDSON.

Frisch, O. von: Treatment of Compound Fractures of the Femur (Behandlung der komplizierten Oberschenkelbrueche). *Wien. klin. Wochschr.*, 1915, lxii, 1299.

The author has had abundant material to deal with since the war which has necessitated a change of opinion as to some therapeutic measures. Most surgeons are more conservative with reference to operation in infected fractures than they were at

the beginning of the war. He emphasized the question of the extraction of sequestra, particularly in infected fracture of the neck of the femur. In comminuted fractures in other locations it has been found that a loose fragment of bone forms a sequestrum without suppuration and can be left alone, but this does not seem to be the case at the neck of the femur.

The author had four cases in which severe suppuration of the upper end of the femur was due to sequestration of the head of the femur, and after it was removed the suppuration rapidly disappeared. In all four cases the head had necrosed. Three of the patients were still under treatment, but the fourth was demonstrated to the society. He was wearing an apparatus that enabled him to walk. The author, therefore, concludes that while sequestra of the shaft of the bone may be left to heal of themselves the head should be removed if it is fractured. Its greater tendency to suppuration is due to the poorer blood supply of the upper end of the bone. The same is true of the neck of the humerus.

A. Goss.

Roberts, J. B.: The Treatment of Fractures, a Lost Art. *Penn. M. J.*, 1915, xix, 74.

The author calls attention to the lack of instruction in bloodless non-operative treatment of closed fractures, and ascribes the "operative addiction" to the failure to lay stress upon such fracture treatment in medical schools, the lack of experience offered internes and young practitioners in hospitals, and the tendency to show blood-letting or open fracture treatment in clinics.

Eighty-five per cent of subcutaneous fractures give good anatomical and functional results with efficient care. Open operation, therefore, has an imperative field in about 15 per cent of closed fractures and a somewhat larger per cent in open-air (compound) fractures.

The author believes the calamities resulting from the modern "operative addiction" is resulting in a change of attitude in the medical profession which will result in the establishment of hospital fracture wards and better treatment by successful subcutaneous methods. Open operation is sometimes imperative, but may be avoided by examination under ether and setting by skilled hands in the majority of cases.

H. W. MEYERDING.

Schmerz, H.: Extension Treatment with Callipers in Gunshot Fractures (Die direkte Klammer-extension bei Knochenbruechen, insbesondere bei Schussfrakturen). *Beitr. z. klin. Chir.*, 1915, xcvi, 425.

Schmerz describes his method of treating fractures. A sharp pointed caliper is inserted into the bone to which the extension is to be applied, and the weight is hung on a ring at the outer extremity of the calipers. The principle is the same as that in Codivilla's nail extension. The calipers are made in various sizes, adapted for use in bones of

all cases. Illustrations are given of the method of applying them and roentgenograms show the results in cases that have been treated in this way. The calipers should not be inserted into a hematoma, nor into phlegmonous or suppurating tissue. The calipers should not be driven into the marrow; they must avoid the joint, and in growing individuals they should not pass through the intermediate cartilage. The best points for inserting the calipers in the different bones are given. The skin is disinfected with tincture of iodine or tannin alcohol at the points where the calipers are to be inserted; local anesthesia is given with 5 per cent novocaine. A small incision is made through the soft parts and through the periosteum and the points of the calipers inserted. It has been found that there is less pain in this way than when the points are pushed in without a previous incision. There is of course a slightly increased danger of infection, but this can generally be avoided with care.

A close watch should be kept over the patient after the extension is applied to see that the calipers do not cut through soft parts or bone and to see whether any inflammation is beginning around the points of insertion.

Much less weight is required than in adhesive plaster extension. The weights used vary, but on an average 3 to 5 kg. is enough for the leg, 3 to 5 kg. for the femur, 4 to 5 kg. for the elbow, and about 1 kg. for the fingers and toes. The average duration of extension is 18 to 21 days for the leg, 4 to 5 weeks for the femur, 18 to 20 days for the arm, and about two weeks for the small bones of the hand and foot. After this length of time of course there is only a soft callus, but a splint or plaster cast can then be applied.

The disadvantages of this method as compared with adhesive plaster extension are that a small wound must be made in the soft parts, which persists for a while after the cessation of treatment; the pain which occurs in some cases; the danger of infection, which is slight, but must be considered, and the possibility of overcorrection if too great weight is used. Its advantages are that it acts directly on the peripheral end of the fractured bone; the possibility of exercising very strong traction; the uniformity of this traction throughout the treatment, while the adhesive plaster strips easily pull off; the slight surface affected by the traction; the fact that not only the fractured point but the whole limb is left readily accessible to treatment. This makes it possible to begin after treatment very early. It is particularly valuable in cases where the limb is so severely injured as to leave little room for the application of adhesive strips. A. Goss.

Moore, J. E.: Operative Treatment of Bad Results After Fracture. *Surg., Gynec. & Obst.*, 1913, 17, 529.

The two great misfortunes that may follow fracture are non-union and deformity accompanied by disability. Experience has demonstrated that

syphilis is not nearly so common a cause of non-union as was formerly believed. Most cases of non-union occur in healthy individuals of middle life, old age and youth being comparatively exempt. Non-union in fracture of the neck of the femur is not due to age, but to the fact that the fragments are not brought in apposition and held there.

Fracture of the neck of the femur is quite common in youth and childhood; many cases of coxa vara are really unrecognized fractures of the neck. Since the advent of the X-ray there is no excuse for non-union due to improper adjustment of fragments. Non-union is excusable only in those patients who, for reasons not understood, have not the power of producing osteoblasts. It is useless to apply Lane's plate in these cases. It is now possible to secure bony union in a large percentage of these cases by the use of the bone graft. The presence of the graft undoubtedly stimulates osteogenesis. Whether the graft itself has osteogenetic properties is a mooted point. Grafts from the patient's own person are the best, and retained periosteum adds to its efficiency. Whether the periosteum has real osteogenetic properties is still a disputed question.

The Buchanan method, in which a piece of bone is removed from each of the two fragments, one long and one short, and then transposed so that the long piece bridges the seat of fracture, has been used most frequently by the author because it can be done successfully with the mallet and chisel. The most commonly accepted method is guttering the fragments and filling the gutter with a transplant taken from the patient's tibia. The only objection to this method is that it requires an electric bone saw. The author recommends that no unabsorbable material be used.

Operations for the relief of deformities are often disappointing, but sometimes very gratifying; they are always difficult. The difficulty is to prevent the formation of new bone after the operation which will interfere with the function of the limb. The best means of defense in these cases is to cover the raw surface with fascia taken from the patient's body. In compound fractures operation should be undertaken early before Nature has thrown out new bone in a faulty position. In every case in which the fragments can not be properly adjusted by manipulation open operation should be resorted to. The author cites a number of illustrative cases and recommends the use of the osteoclast to reduce the deformity in Pott's fracture, insisting that the reduction should be made before bony union has commenced, and that the limb should be put in a position of overcorrection so that it will be unnecessary to introduce any foreign material to hold the fragments in place.

Lowman, J. B.: The Treatment of Complicated Fractures and Present Opinion of Operative Treatment. *Proc. M. J.*, 1913, 313, 76.

Little had been written regarding open operation for fractures until the X-rays brought forcibly to

the attention of the profession the poor results both functional and cosmetic and the possibility of medicolegal complications. Following the X-ray, Lane's paper before the American Medical Association at Atlantic City stimulated surgeons everywhere in the use of the open method, plates, etc., and many failures resulted, due to careless technique.

A study of fracture plating has taught (1) that in some instances delayed union is present because of too close approximation and immobilization, inhibiting callous formation; (2) that it produces bone absorption; (3) that it produces infection and bone necrosis; and (4) that compound fractures should never be plated.

Indications for open treatment are: (1) fractures that cannot be properly reduced; (2) fractures in which no crepitus can be elicited, foreign bodies such as muscle and fragments of bone intervening; (3) complicated fractures about joints that cannot be reduced.

Bone-grafting was the next advance in fracture treatment and is far superior to other methods. Yet such fractures as the thigh, etc., are offered ideal treatment by plating, when not properly reduced.

Of 25 cases of fracture of the thigh, 23 returned to their usual work in six months, while 20 of 25 cases treated by the closed method were required to seek lighter work. Only one plate required removal from the thigh, though in the tibia and other more exposed areas plates were removed much more frequently.

The author advises that Wassermann tests be made in all operative bone cases. He is convinced that plating in some cases prevents union, and has had the experience of seeing patients return after six or seven months with bent plates and no evidence of union. Bone pegs are recommended in delayed union.

In amputations, periosteum is not especially cared for and no ill results follow. Periosteum is looked upon as a limiting membrane. Bone transplanted from one specie to another does not grow, but transplanted from one person to another it is successful in 40 to 50 per cent of cases, while autogenous grafts are successful in 90.5 per cent of cases. Bone transplants seem to have a certain immunity to infection, especially tubercular. Rigid adherence to Lane's technique is recommended.

Living bone must be brought in contact with living bone for successful grafting in non-union. In order to accomplish this one must be sure to get the graft beyond the area of sclerosis at the ends, for here bone proliferating cells are scarce.

Treatment of fractures though revolutionized in the past ten years is gradually returning to the more conservative methods. It has been found that the poor results have been due to bad technique and the use of plates, prohibiting union. The ideal method of approximating fractures is with the autogenous bone-graft; and better results are

obtained by open method in fractures around and in the joints that can not be reduced.

H. W. MEYERHINE.

Ansinn, O.: Extension Apparatus with Passive and Automatic Movements (Streckverbandapparat mit passiven und mit automatischen Gelenkbewegungen). *Beitr. z. Klin. Chir.*, 1915, 10:3, 559.

The author describes an extension apparatus for fractures of the long bones of the leg. By means of this apparatus passive motion may be applied to the hip, knee, and ankle joints throughout the course of treatment without disturbing the extension. He also describes an improvement of this apparatus, which makes it possible to get automatic movements of these joints by means of an electric motor.

He gives case histories of 9 patients treated with his apparatus and 3 by the usual motionless extension, giving illustrations of the degree of motion attained at the end of treatment and roentgenograms of the fractures. The 9 patients were able to lift the foot onto a chair immediately upon removal of the extension and never used crutches at all. The other 3 could not make active movements at all, and only very slight passive motion was possible.

M. M. MATTHEIS.

Angelvin, N.: A New Method of Reducing Dislocations of the Shoulder. *Med. Press & Circ.*, 1915, 6, 464.

The author describes his method of reducing dislocations of the shoulder and claims for it the ability to reduce the dislocation without the use of anæsthetic or assistance. His method briefly is as follows:

The first step is to raise the dislocated arm and place it in abduction. The second step is to pass the patient's arm over the operator's neck, making a fulcrum of the patient's side, in order to exert necessary traction. The surgeon firmly holds the dislocated arm with his far hand, and makes extension by twisting his shoulders. With his free hand he can manipulate and direct the movements of the humerus and humeral head, and without undue violence he has force at his disposal to reduce the dislocation.

A case is described, also the mechanism of the dislocation of the shoulder-joint.

C. C. CHATTERTON.

Watkins, J. T.: Congenital Dislocation of the Hip Reduced by Manipulation Followed by Arthrotomy. *J. Am. M. Ass.*, 1915, LVIII, 1863.

The author records a case of a congenital dislocation of the hip in a muscular boy of 6 years, the reduction of which by the manipulative method was uncertain and unsatisfactory. An arthrotomy was performed at a later date. No definite cause for the lack of success could be determined at operation, at which time the reduction was easily made and with excellent stability.

A. J. DAVIDSON.

SURGERY OF THE BONES, JOINTS, ETC.

Morestin, H.: Transplantation of Cartilage in Reparative Surgery (Les transplantations cartilagineuses dans la chirurgie réparatrice). *Bull. et mém. Soc. de chir. de Par.*, 1913, 31, 1924.

Cartilage has long been used in rhinoplasty, but Morestin has found it extremely valuable also in other operations for the repair of loss of substance. He gives detailed histories of 23 cases in which he has used it, with illustrations of several before and after operation. He divides the cases into three groups: (1) those in which the cartilage was used to repair gaps in the skull, or to reconstruct the upper border of the orbit; (2) operations on the malar bone and the lower and external part of the orbit; and (3) operations on the lower jaw.

Any cartilage can be used, but practically the costal cartilages of the sixth, seventh, and eighth ribs are the only ones that are easily obtained. Resection of these cartilages has no bad effects whatever on the patient — neither pain, interference with respiration, nor tendency to hernia resulted. The cartilage can easily be cut into any shape desired to fill the breach in question, and in this respect is superior to any other material. In spite of the fact that it can be handled so easily it is as resistant as bone. The grafts take readily and quickly adapt themselves to their new surroundings; and not only do they take immediately, but they are permanent. The cartilage lives indefinitely without undergoing absorption or suffering any appreciable decrease in size. Cartilage from another person may be used with equal success.

A. Goss.

Tongu, Y.: Transplantation of Bone-Marrow (Über Transplantation von Knochenmark). *Mits. u. d. Med. Fac. d. k. imp. Univ., Tokyo*, 1913, 39, 275.

The author describes his experiments on rabbits and dogs. He removed the bone marrow and made an emulsion which he injected subcutaneously or intramuscularly. The experiments lasted for 21 to 51 days, after which the injected places were cut out and examined microscopically. In other cases the bone-marrow was transplanted *in toto*, and in still others a peritoneum emulsion injected. He found that the osteoblastic activity of the bone-marrow was very much decreased when it was injected in the form of an emulsion. This is due partly to the loss of regenerative power on account of the crushing of the osteoblastic elements, partly to the insufficient volume of the marrow as a matrix of new bone formation, and partly to the increase in the surface of the surrounding tissues for absorption. The new bone tissue that was formed finally disappeared again from absorption. Where the marrow was transplanted entire there was a ring of new bone formed around it. The marrow, especially the central part of it, generally underwent necrosis.

The new bone formation is the greatest when

emulsion of peritoneum is injected, next when marrow is transplanted *in toto*, and least when emulsion of marrow is injected. A plate is given showing the microscopic appearance after injection of bone-marrow emulsion.

A. Goss.

Sick, C.: Changes in the Stumps of Amputated Bones (Veränderungen an amputierten Amputationsstümpfen). *Deutsche med. Wochenschr.*, 1913, 39, 1901.

In the stumps of amputated bones there is always extensive atrophy of the bone due to absorption of bone substance. The external surface of the bone is rough and shows numerous fine linear openings; the marrow cavity is larger than normal and the compact part of the bone is more or less separated into layers. There is a decrease in the number and size of the trabeculae of the spongy part of the bone, and sometimes even a complete disappearance of them. The points of insertion of muscles, tuberosities, linea aspera, and trochanters, are smoother and flatter. This atrophy is most marked if the bone is compared with that of the other side.

It is found that the weight of the amputated bone is not more than one-half or even one-third that of the sound side. This was found in all the stumps examined — about 50 cases. Almost all stumps are closed in at the end with bone, which may be only a very thin layer or may be firm and thick. In amputation of the femur there is an increase in the size of the angle between the shaft and the neck, especially if the stump is short, showing increased traction and decreased pressure.

A. Goss.

ORTHOPEDICS IN GENERAL

Napier, C. D.: Preventive Orthopedics in Infancy and Childhood. *Long Island M. J.*, 1913, 16, 457.

The author reviews the most common deformities of infancy and childhood and calls special attention to the principles of orthopedic treatment of them.

Congenital deformities cannot be prevented, but an exaggeration of them and subsequent disability can be. Club-feet he thinks should be corrected early to prevent overstretching of the muscles, and the treatment should be continued until the muscles and bones have become accustomed to the new position, and a proper muscle balance is obtained. Also in discussing congenital dislocation at the head of the femur, he recommends early and continued treatment until the head of the bone remains fixed in the socket. He states that a year is his usual time for continuing the use of the plaster. Deformities due to rickets, and children suffering from this disease, should receive special care as to sitting and creeping, and care should be used in carrying the child. He suggests that no child should be allowed to begin to walk until he is at least a year old. In slight deformities he recommends that the mother be taught how to manipulate the child's limbs or to adjust a brace, and urges that operation be used only as

the last resort. For rachitic round back in small children, he advises rest in bed. In lateral curvature of the spine he often finds one limb shorter than the other, and deformity may be prevented by raising one heel and the use of corrective gymnastics. He states that flat-foot or weak-foot trouble often begins in childhood, and some slight correction may cure the child; instruction should also be given as to how to walk properly.

The article is full of good suggestions and is of more value to a general practitioner than to one interested in orthopedic surgery. C. C. CHATTERTON.

Martin, E. G., and Lovett, R. W.: A Method of Testing Muscular Strength in Infantile Paralysis. *J. Am. M. Ass.*, 1915, lxx, 1512.

The index of muscular power employed is the resistance of the muscle group to a steady pull sufficient to overcome it. A sling is adjusted in an assigned position over the part of the limb in which the muscle group to be tested has its insertion. The sling is fastened to an accurate spring balance through which the pull is exerted. The balance must be held carefully in a line at right angles to the axis of the part of the limb to which the sling is adjusted, and is read either at the instant the muscle yields, as in the test of plantar flexion, or when the member is drawn into an assigned relationship with the body, as in knee extension.

A standard technique has been worked out for many of the movements of the legs and arms.

The tests in detail will be described in a subsequent communication.

They have prepared, on the basis of tests on a large series of normal children, tables of standard muscle strengths for ages from 4 to 16 years.

PHILIP LEWIN.

Frauenthal, H. W.: Painful Feet; Causes and Treatment. *J. Am. M. Ass.*, 1915, lxx, 1897.

Frauenthal calls attention to the great frequency of foot infections which are secondary to focal infections in other parts of the body, as the teeth, gums, mouth, and nose; also following grip, pneumonia, typhoid fever, etc., and in children after tonsillitis, measles, scarlet fever, etc. The treatment of this class of cases should consist in the eradication of the focus of infection and temporary support of the arches by plaster of Paris, adhesive strapping, Whitman plates, or felt pads. Infectious arthritis of the feet from non-gonorrhoeal leucorrhoea is described, as well as gonorrhoeal and syphilitic conditions.

The author's method of treating gout consists in applying a sponge electrode saturated with the fluid extract colchicum attached to the galvanic current, reversing the current every two minutes and using a strength up to the patient's tolerance of pain. Three treatments in thirty-six hours relieved all acute symptoms of pain, swelling, etc., in the author's cases.

Obliterating endarteritis occurs most frequently among the Russians, Poles, and Galicians, and is characterized by intense pain in the toes and feet, extending up the leg, increasing at night. The patient walks with a distressing gait, and the feet are blue, congested, and cyanotic, but not sensitive to manipulation or pressure. Sensitiveness to heat and cold is diminished, the skin has a cold, clammy feeling, and pulsation of the plantar arteries is either unrecognized or decidedly enfeebled. The author claims satisfactory results from treating this condition with the white electric light and the internal administration of thyroid gland.

R. B. COFIELD.

SURGERY OF THE SPINAL COLUMN AND CORD

Frangenheim, P.: Gunshot Injuries of the Spinal Column and Spinal Cord (Schussverletzungen des Rückenmarks und der der Wirbelsäule). *Muenchen, med. Wchnschr.*, 1915, lxi, 1473.

Frangenheim has operated in 25 cases; of these 9 have died and the others were discharged after four to six weeks' treatment, some of them improved, and some, in whom there was only partial paralysis, practically well. There is no way of making a certain diagnosis as to the extent of a spinal injury. It is very difficult to localize projectiles accurately. Fractures of the spinous processes are hard to demonstrate roentgenologically and small fragments broken off from the bone and compression of the cord from bone fragments cannot be so demonstrated. As a rule splintering of the bone cannot be demonstrated till the muscles have been stripped off from the processes.

Contusion of the cord, compression of the cord, and complete transverse severing of it all give the

clinical picture of complete paralysis with loss of control of the bladder and rectum. It cannot be determined from the reflexes whether the cord is completely severed or not; therefore the author advises exploratory laminectomy in all cases; further treatment depends on the findings. Early operation is generally preferred to expectant treatment.

Lumbar puncture over the site of the injury is of considerable value in diagnosis. Frangenheim admits that his numbers are small and that later complications may yet appear in some cases, but he is convinced that exploratory laminectomy is the best method of procedure in these cases. A. GOSS.

Thomas, H. B.: Treatment of Tuberculous Diseases of the Spine. *Illinois M. J.*, 1915, lxxviii, 321.

The successful treatment of tuberculosis of the spine depends upon the following factors:

1. Its early recognition before extensive destruction has taken place. Nurses should be especially

trained to note the signs and symptoms of this disease that they may detect the condition in its incipency and advise proper treatment before the vertebral bodies are destroyed.

2. Recumbency is preferable during the acute stage. If the disease is below the seventh or eighth dorsal it will do well without apparatus if the patient is kept quietly on his back. If the disease is in the cervical, high, or subdorsal region, apparatus for producing extension will be of advantage.

3. In the subacute or chronic stages the patient should, if possible, have such fixation as will allow of ambulatory treatment.

4. The proper treatment of an abscess is to "leave it alone." When an abscess is to be drained great care should be taken against infection.

5. Pott's paraplegia is often successfully treated by extension, but occasionally laminectomies or osteoplastic resections are necessary.

6. The operative treatment, such as Albee and Hibbs have devised, fills an important place in the cure of caries of the spine, and as the technique is improved it will become more and more important among the methods of treatment.

7. The time element in the cure of this condition

varies with the case and with the method of treatment used; operative treatment often reducing the time two-thirds.

ROBERT B. CORFIELD.

Fassett, F. J.: Late Results of Excision of the Transverse Process of the Fifth Lumbar Vertebra. *J. Am. M. Ass.*, 1914, lxx, 1775.

From the author's experience in three cases of resection of the transverse process of the fifth lumbar vertebra he draws the following conclusions:

1. In three cases permanent relief from lumbar or sciatic pain was obtained by the operation.

2. The operation should be regarded as a method of last resort only.

3. The chief danger is an injury to the great nerve-trunk.

In one case relief of left sided pain was obtained by resection of the enlarged right process. The author explains this by saying that there was possibly an injury to the nerves upon the left side due to a leverage action of the right process upon the ilium.

The author is not certain as to the best method of approach, but care should be exercised to avoid injury to the great nerve-trunks. G. I. BAUMAN.

SURGERY OF THE NERVOUS SYSTEM

Ferrand, J.: Neurology in War (Reflexions medico-chirurgicales sur la pratique neurologique en temps de guerre). *J. de medec.*, 1915, l, 679.

Injuries of the large nerve-trunks are very frequent. The diagnosis is easily made, but the wounds rarely heal without suppuration, which renders operation on the nerve impossible. Operations for the repair of nerves should never be undertaken within the first two months after injury, and sometimes even longer.

When it comes to considering the question of operation there are three classes of cases:

1. Those in which the nerve is merely compressed by cicatricial tissue. Motor paralysis is not complete; there is not complete reaction of degeneration or semicircular contraction, but sometimes there is extreme pain. Operation is indicated in these cases and is very successful. The nerve is freed from scar tissue, displaced so that it runs through normal muscle, and the wound closed aseptically.

2. Those cases in which the nerve is partially severed. In these there is little or no pain and no trophic disturbances; paralysis corresponds only to the fibers that are severed. These cases should not be operated upon. The normal fibers serve as a guide along which the severed fibers are gradually reconstructed. Animal experimentation as well as clinical experience has shown that such reconstruction does take place. Electrotherapy is the sovereign treatment in this group.

3. Those in which the nerve is completely severed. In these cases motor paralysis is absolute in all the

muscles innervated by the nerve in question. There is also anesthesia, complete reaction of degeneration in the peripheral end, and trophic disturbances begin to appear.

Opinions are divided as to the advisability of operation. Ferrand is inclined to think it is generally not indicated. When it is performed there is apt to be neuritis of the peripheral end, which interferes with regeneration. This is especially apt to occur in the painful cases, so that it is in these that operation is most contra-indicated. Some operators resort to all scar tissue and resect the severed ends, but the author believes that such resection is rarely if ever successful; he favors the more conservative method of simply dissociating the fibers from all fibrous tissue, leaving them to form a bridge for the reconstruction of new nerve-fibers. Careful electrical examination is the most important point in making a differential diagnosis of the different classes of injury.

A. Goss.

Reich: Osteoplastic Approach to the Brachial Plexus Below the Clavicle (Osteoplastische Freilegung des Arminnervengeflechts unterhalb des Schlüsselbeins). *Beitr. z. klin. Chir.*, 1915, Kriegerchir., p. 132.

The author's technique consists mainly in the temporary osteoplastic resection of the middle portion of the clavicle. From a supracleavicular, transverse incision, reaching from the sternocleid to the trapezius muscle the plexus is laid bare in the supracleavicular fossa. To this an incision is added

in a right angle across the clavicle at the insertion of the sternocleidomastoid muscle and another at the insertion of the trapezius, and the portion of the clavicle between the two cross incisions is resected after drill holes have been placed on both sides of each plane of section. This approach between the two muscles offers a very good view of the plexus, especially for the purpose of suturing in cases of severance of the nerves. Reich has applied the method successfully in five cases. A. STEINDLER.

Sicard, J. A.: Treatment of Injuries of Peripheral Nerves During the First Year of the War (*La pratique des blessures nerveuses périphériques de guerre pendant une année*), *Bull. et mém. Soc. méd. d. hôp. de Par.*, 1915, xxxi, 1139.

From his treatment of nerve injuries during the past year, Sicard concludes that operation is indicated when after three months there is no sign of recovery of motor function, and reaction of degeneration is

complete. These are the only symptoms that justify the assumption that the nerve is completely severed. There are no signs that prove it definitely. There are also a few cases in which the paralysis is progressive, rather than showing a tendency to improvement as it generally does.

Operation is indicated in these cases even if paralysis and reaction of degeneration are not complete. The operation consists in liberating the nerve from cicatricial tissue or from resection and direct suture. Liberation of the nerve gives a very good percentage of improvements, but in suture after complete severing of the nerve, with total motor paralysis and total reaction of degeneration, he has never seen a case in which normal motility or normal electrical reactions were re-established, notwithstanding the fact that some of his cases were operated upon more than a year ago. Nevertheless operation is indicated in these cases, as it offers the only possible hope. A. Goss.

SURGERY OF THE SKIN, FASCIA, AND APPENDAGES

Wagner, K.: Subcutaneous Granulomata (*Subkutane Granulome*). *Wien. klin. Wochenschr.*, 1915, xxviii, 1078.

Wagner reports a number of cases in which subcutaneous granulomata developed, not only after bone injuries but after wounds of the soft parts. The scar tissue was at first rather sensitive and gradually a tumor developed under the skin. The tumors were so painful when the limbs were moved that they interfered with walking. The tumors were 5 or 6 cm. in diameter and movable over the underlying tissues. They were pale and gelatinous, in contrast with normal red granulation tissue.

These tumors are relatively rare and rather difficult to account for in injuries of the soft parts. In bone injuries they might be due to irritation from small sequestra. Wagner concludes that they are due to the inclusion of granulation tissue between two layers of older, harder, connective tissue; this young granulation tissue may develop into a pathological granuloma, which is a benign tumor and should be removed surgically under local anesthesia. A. Goss.

Law, A. A.: The Clinical Status of the Autograft. *Ann. Surg.*, Phila., 1915, lvi, 602.

Heteroplastic transplants have been entirely unsatisfactory. The essentials for the life of the

transplant (autograft) are an aseptic field, perfect hæmostasis, sterile plasma, and the prevention of even gloved fingers from touching the wound or transplant. In the repair of ununited fractures, the bone-graft — either inlay or intermedullary insert — has proven most valuable. It is important to use a graft sufficiently long to extend well beyond the sclerosed bone at the ends of the fragments.

Fascia lata is used for strengthening ventral hernia repairs in fat subjects, fascia and fat for restoring tendons (the fat preventing adhesions), for repairing defects in the dura, etc. Fascial tubes are used to conduct proliferating axons after loss of section of a nerve-trunk. Fascia, also, is used in arthroplasties, a free graft being advisable in all except the weight-bearing joints, in which, the better nourished pedicled graft is recommended.

Homotransplants of skin are usually successful; the epidermis should always be scarified to permit of lymphatic drainage.

The transplantation of complex tissues, e.g., thyroid, has not been successful, for while vascularization is feasible, innervation is not. Homografts of thyroid tissue are always absorbed; autografts have remained feebly functioning for two years.

The greatest problem of the future is the prevention of immunity or antagonism of fluids of one body to tissues of another. LISTER TUDHILL.

MISCELLANEOUS

CLINICAL ENTITIES — TUMORS, ULCERS, ABSCESSSES, ETC.

Pope, C.: The Autolysin Treatment for Cancer. *N. Y. M. J.*, 1915, cx, 719.

The author reviews a series of 52 cases of malignancy treated with autolysin. In some cases

the results seem encouraging, in a few even remarkable. The symptoms of distress, pain, offensive discharge, etc., seem to be greatly relieved in many of the cases. Apparent diminution in size or even disappearance of the growth was reported in several of the cases. J. H. SKILES.

Lathrop, A. E. C., and Loeb, L.: Further Investigations on the Origin of Tumors in Mice. Tumor Incidence and Tumor Age in Various Strains of Mice. *J. Exp. Med.*, 1917, vol. 34.

In 1907 the authors published some observations made at the mouse farm of Miss Lathrop in Granby, Mass., which made it apparent to them that the frequency of tumors in mice at certain places was in all probability due, not to infection, but to hereditary transmission in certain families. From time to time they have published the results of their work and this article gives further results of their investigations. Their material has been very abundant and this has enabled them to arrive at more detailed figures concerning cancer rate and cancer age in the successive generations of the various strains, and it has brought out some new facts, especially regarding the relation between cancer rate and cancer age. They were finally able to draw from this extensive analysis the following conclusions:

1. There exists a certain relationship between tumor frequency and tumor age. On the whole, the more frequent the tumors, the earlier they appear in the various strains. It might be conceivable that the frequency of the tumors was independent of the tumor age; that in strains in which the tumor-frequency is greater, the tumors appear in the same percentage in the various periods of life, but this is evidently not the case. In strains in which the tumor-frequency is greater, the tumors also appear on the whole at an earlier period of life.

2. This parallelism between tumor frequency and tumor age is, however, not complete. The tumor age seems to be as characteristic for a strain as the tumor rate. In strains with a similar rate of frequency, the tumor age may be different. This difference is probably not accidental, because (1) if substrains are related to each other the tumor age is usually similar in all of them, and (2) the tumor age of the constituent strains seems to influence the tumor age of the crosses. How far this latter relation holds good will be discussed in another communication. On the other hand, in the case of the substrain Silver, it had a similar tumor age to the English strain, although the tumor rate of the Silver strain is considerably lower than that of the other English strains.

3. The tumor age is transmitted from generation to generation in a similar manner to the tumor rate. It may, therefore, be concluded that in all probability tumor rate and tumor age represent distinct unit factors which frequently, but not in all cases, are in some way linked to each other.

4. It may be further concluded that the age at which the maximum of tumors occurs varies in different strains. While in some it appears in the second period of life, in others it is in the third period. Here, again, the maximum is on the whole

reached at an earlier period of life in strains with a high tumor rate, but in this regard peculiarities also exist in different strains. — GEORGE E. BRIDGE.

Konjetany, G. E., and Weiland, W.: Glycosuria and Diabetes in Surgical Diseases (Glycosurie und Diabetes bei chirurgischen Erkrankungen). *Mon. u. d. Grenzgeb. d. Med. u. Chir.*, 1917, 17, 1, 17-34, 35.

The authors find that in about 50 per cent of fracture cases there is a spontaneous or alimentary glycosuria, which is transitory. Polydipsia and polyuria, the symptoms of diabetes, are not present, but there is hyperglycemia. It is a transitory central lesion like sugar following puncture. It may be an anatomical injury, for instance from fat embolism, or a purely functional disturbance, or a combination of both. The glycosuria generally begins immediately after the injury or within a few days; it generally begins to decrease by the end of ten days, and by the end of fifteen or twenty days the condition has become normal again. There are cases, but they are very much rarer, of true traumatic diabetes, but they do not appear until much longer after the injury, about six months to a year, and are then persistent and accompanied by the other symptoms of diabetes. — A. Goss.

Bérard, L., and Lumière, A.: Late Tetanus (Sur le tétanos tardif). *Ann. Chir.*, 1917, 11, 404.

Bérard and Lumière have had occasion to observe a number of cases of tetanus that developed long after the injury, even though the patients were given preventive injections of antitoxin. They conclude that these were secondary reactivations of latent tetanus, brought about by late surgical operations. Animal experimentation has shown that spores may remain in the body and be liberated later and produce disease. Four cases are described in which this must have been the mechanism of production of the tetanus, for it came on after surgical operations as late as three months after the injury, too long a time to be considered the incubation period of the original infection. There was no reason to suppose that a fresh infection was introduced at the time of the operation, for the same surgeons had operated with the same instruments on other patients without producing tetanus. The authors therefore recommend giving another preventive injection of antitoxin before any surgical operation on a patient who has been exposed to tetanus.

The use of sodium persulphate in the treatment of tetanus is discussed. The authors used it experimentally on guinea pigs and dogs and found that it controlled the convulsions as well and prolonged life so much beyond that of the control animals that they have used it clinically. Tables are given showing the results in 41 cases. Injections of 20 ccm. of a 5 per cent solution are given intravenously; the injections are continued for one or two weeks, their frequency depending on the course of the disease.

Convulsions stop after the injection but permanent contractures and trismus persist. The patients are less sensitive to external irritation and do not have those painful spasms that make tetanus such a dreaded disease. Among the 41 cases 8 came in in such serious condition that they were not given the treatment, or at most only one or two injections, which is not a fair test of the method; 4 died of intercurrent affections, 16 recovered and 13 died.

A. GOSS.

Hercher, F.: Intravenous Use of Ether-Salt Solution in Tetanus (*Anwendung von intravenösen Äther-Kochsalz-Infusionen bei Tetanus*). *München med. Wchnschr.*, 1915, lxi, 1126.

In the case described by Hercher the first signs of tetanus appeared 14 days after the injury, and in spite of the use of antitoxin, magnesium sulphate, and morphine the symptoms kept on growing worse until the sixth day, when there was an improvement. Four days later there was a severe relapse. Hercher then gave an intravenous injection of 15 ccm. ether in 750 ccm. physiological salt solution. The patient slept well after it and the convulsive attacks stopped, but the general rigidity persisted. After several repetitions of the injection there was progressive improvement and finally recovery.

Hercher believes the good result in the case cited was due to the injection of ether and salt solution, and thinks it is possible that the ether reached the lecithin of the nerves and central nervous system, and caused a breaking up of the combination between the ether soluble lecithin and the tetanus toxin, so that the latter could be discharged from the body.

A. GOSS.

Bradner, M. R., and Reimann, S. P.: Observation upon the Elimination of Acetone and Diacetic Acid in Two Hundred and Fourteen Surgical Cases. *Am. J. M. Sc.*, 1915, cl, 727.

In studying 214 consecutive surgical patients it was noticed that acetone was eliminated in a large percentage of cases — 85 per cent. There was little reference to the objective condition of the patient, the severity of the pathology, or the gravity of the operation. The more emotional, frightened, or anxious individuals invariably were more shocked, and also showed more acetone. Diacetic acid was less frequently met with—in 17 per cent—and then only several days after the operation, and in women showing large outputs of acetone. No diacetic acid was found in men, while 38 per cent of the women showed it. Ether was the anæsthetic in all but 4 cases.

J. H. SKILES.

Muns, W. E.: Peripheral Vasomotor Changes in Shock. *J. M. Sc. H. Ass.*, 1915, xii, 432.

Trauma to the exposed intestines brings about a certain vasomotor response in the blood-vessels of the periphery, and this response is a reflex vasoconstriction. This change in the peripheral vessels begins almost immediately when the intestines are

disturbed and continues as long as the stimulation is applied.

This vasoconstriction in the peripheral vessels is an important factor in maintaining the blood-pressure in cases of gradually developing shock from intestinal trauma, thus overcoming the blood-pressure-lowering effect of the splanchnic dilatation. Whenever the intestinal irritation is not accompanied by vasoconstriction of the peripheral vessels, the blood-pressure tends to fall. Whenever the vasoconstriction is present but slightly, the blood-pressure shows itself to be better maintained. When the vasomotor centers can bring about a marked vasoconstriction the tendency toward the maintenance of the general blood-pressure is greater, and in some cases there is an actual rise of blood-pressure.

Since there is no reason to suppose that the vasoconstriction center is the variable factor in the difference of vasoconstrictor effect which was obtained, it is reasonable to assume that the results are to be explained by the variation of the normal degree of vasoconstriction present in the periphery at the inception of the experiment. If the vessels were dilated, then reflex constriction could occur to a great extent and aid in the retention of normal blood-pressure. On the other hand, if the peripheral vessels were well constricted, further constriction from trauma would be impossible and the compensatory effect being absent the blood-pressure would fall.

In other words, the effect of intestinal trauma on blood-pressure is determined by the relative degree of constriction or dilatation which exists in the periphery at the inception of the procedure.

EDWARD L. CORBETT.

Corbett, J. F.: The Use of Epinephrin and Transfusion in Treatment of Shock. *Tr. West. Surg. Ass.*, Des Moines, 1915, Dec.

The author limits the use of epinephrin and transfusion to those cases of post-operative and traumatic shock where an extreme picture presents of pallid mucous membranes, low blood-pressure, unconsciousness when anæsthetic is discontinued, and threatened failure of respiration. In these cases the administration of epinephrin carefully guarded by blood-pressure determinations and continued for several hours is recommended.

The use of the epinephrin should be so guarded as never to allow the blood-pressure to go over 90 or 100 mm. Hg. Transfusion is advised only in cases where there has been loss of blood volume, either as a result of shock and hemorrhage or in pure shock resulting from transudation into the tissues without hemorrhage. After the vessel tone has been established transfusion should be done. This recommendation is based on a long series of animal experiments and on the results of three clinical cases. In the research a study of fifteen clinical cases of shock is included in which other lines of treatment had been pursued.

SERA, VACCINES, AND FERMENTS

Brauntenbreunner, J.: The Present Status of the Abderhalden Reaction and of the So-called "Abwehrfermente." *J. Lab. & Clin. Med.*, 1915, 1, 79.

The author first discusses the theory of the Abderhalden test and the principles upon which the theory rests. He then goes into an elaborate exposition of the technique of the test, including the preparation of the blood serum, the adsorption and testing of the dialysing thimbles, the method of obtaining and preserving the placental material used as a substrate, with special emphasis on points in the technique on which a beginner is apt to fall into error. He describes the technique of the test proper after the preparation of the various constituents, and also discusses the matter of control tests. He discusses the various factors influencing the ninhydrin reaction, such as acidity or alkalinity of the dialysate, concentration of fluid, unequal boiling, and contamination of the dialysate by perspiration, saliva, etc. He also points to certain inherent difficulties in the test that no amount of care on the part of the operator can discount. For example, a tube may leak in the test, although it was perfect at the time of the preliminary testing. Fumes and dust are also sources of error, as are dialyzable substances in the serum before digestion occurs.

He then goes into an extensive discussion of the theory of the *Abwehrfermente* of Abderhalden, giving a review of the literature and calling attention to the similarity of the ferments of Abderhalden to the complement of Ehrlich. He concludes that the ferments of Abderhalden are not specific. Although he does not feel that it has been proved, he suggests from his work that the "defensive ferments" very closely resemble in nature the antibody or amboceptor of Ehrlich. He quotes some experiments to substantiate this view.

He describes a modification of the Abderhalden test using serum antitrypsin determination as a guide in determining the amount of digestion. This method, however, is difficult of performance and must be very carefully done to obtain reliable results. He describes a serum-skin reaction in which he uses antolyzed serum after treatment with a specific substrate, for skin injection. For this reaction he claims good results. F. H. FALLS.

BLOOD

Burckhardt, H.: Internal Hemorrhage in the Thigh (Innere Verblutung in den Oberschenkel). *Monat. f. klin. Chir.*, 1915, LVIII, 348.

Burckhardt reports a case from a field hospital of a bullet wound of the left thigh. There was a small, round entrance wound midway between the anterior superior iliac spine and the patella, with slight bleeding from the wound. There was increasing pain and swelling in the thigh and the patient was restless. The pulse grew worse continuously and about

17 hours after the injury the patient died. Autopsy showed great swelling of the thigh and hemorrhagic infarct of the scrotum and penis. There was a hematoma of the left buttock. The femoral artery and vein were uninjured. Back of them there was a large cavity with the musculature all around it torn to shreds. Through the cavity pinned bands made up of vessels and nerves, some of them injured, some of them uninjured. It was impossible to determine from just what vessels the bleeding had taken place. There was no fracture of the femur or pelvis. In the wound cavity there were four fragments of metal.

Such a hemorrhage in a cavity that had not existed beforehand is only possible when the entrance wound is small, when the exit wound is small or lacking entirely, and when the bullet has enough explosive effect to destroy the surrounding tissues. All these conditions were fulfilled here. One must know that such an internal hemorrhage is possible when neither thoracic nor abdominal cavities are injured in order to be prepared to operate promptly when the patient becomes restless, shows signs of increasing anemia, and the pulse grows worse. If tamponing is not sufficient and the bleeding vessels cannot be gotten hold of it may be necessary to amputate the limb. A. Goss.

BLOOD AND LYMPH VESSELS

Jerusalem, M.: Treatment of Aneurisms (Behandlung der Aneurysmen). *Wien. klin. Wochenschr.*, 1915, LVIII, 1129.

The author demonstrated before the Vienna Medical Society a patient with arteriovenous aneurism of the carotid and right jugular whom he had treated conservatively because he had a goiter and operation would have been dangerous. He has had in all 23 cases of traumatic aneurism, 20 of which were operated upon and 3 treated conservatively. Of the 20 operated cases ligation was used in 19 and suture of the artery in only one. In only one case was there gangrene that necessitated amputation; this was an aneurism of the popliteal artery, and the patient died of septicemia. Two other patients who were in a very septic condition when admitted died a few days after the operation, without there having been any gangrene of the operated extremity. In both cases there was severe injury of the bone in addition to the blood-vessel injury. The other 17 recovered uneventfully.

The operations were performed in most of the cases about two months after the injury. They were all false aneurisms. No Eschmarch's bandage was used. The arteries were laid bare, ligated distally from the aneurism, the sac opened, clots removed, the vessels ligated, and if the wound was infected it was left open; in clean cases the opening is sutured all except a small drainage opening. In one severely infected case of aneurism of the femoral artery, on account of the bad condition of the patient, the artery was simply ligated in the groin and the sac

opened, but there was a hemorrhage afterward which made it necessary to open up and ligate at the site of the aneurism. The patient finally recovered.

From the author's experience he disagrees with the conclusions of von Haberer, Frisch, Zahradnicky, Heyrovsky, and others with reference to the treatment of choice. He believes that the best method of operation is double ligation at the site of the injury, at least in those cases where operation is performed several weeks after the injury.

A. Goss.

Moszkowicz, L.: How May We Lessen the Dangers of Gangrene After Operation for Aneurism (*Wie vermindern wir die Gefahr der Gangraen nach Aneurysmen-Operationen?* *Beitr. z. klin. Chir.*, 1915, XLVII, 369).

For the control of gangrene after operation for aneurism, two things are under the control of the surgeon, providing there is no indication for immediate operation; namely, the method of operation and the time of operation. In the former the primary consideration is to save as many of the branches of the affected artery as possible; in the latter to allow sufficient time for the establishment of the collateral circulation.

The author discusses extensively the advantages and disadvantages of ligation without and within the aneurismal cavity, end-to-end anastomosis, etc. He says he applies the principle, that a tissue which can become actively hyperæmic has at least the minimum circulation necessary to sustain life, to the selection of the time for operation by testing for active hyperæmia in the part supplied by the artery. The limb is made anæmic by inhibiting the entire circulation below the aneurism for two minutes by means of a constrictor, then releasing the constriction and compressing the artery above the aneurism. If an active hyperæmic reaction is obtained the collateral circulation is sufficient.

M. M. MARTINES.

Levings, A. H.: Some Affections of the Blood-Vessels Which May Become Surgical. *Internist. M. J.*, 1915, XXII, 989.

There are three groups of cases of affections of the blood-vessels which may lead to gangrene of the extremities: (1) Raynaud's disease with its allied affections due to vasomotor disturbances; (2) the thrombo-angiitis obliterans of Buerger, due to a limited thrombus in the anterior and posterior tibial vessels; (3) senile gangrene, mechanical, due to arteriosclerosis, endarteritis obliterans, and diabetes.

After a concise description of the pathology and symptomatology of cases belonging to these groups the author cites two of his own cases in which operation was indicated and points out the difficulty of harmonizing their histories and pathological findings with any group picture. In one of his cases which showed the signs and symptoms of group 2, much symptomatic relief was obtained by ligation

of the femoral vein. In his other case, likewise suggestive of group 2, amputation and reamputation in the middle of the thigh became necessary because of spreading gangrene.

In his discussion of the treatment of gangrene or threatened gangrene, the author deplors the lack of study as to the causative factors. Treatment may be divided into conservative and surgical. Among conservative methods are mentioned: rest in bed, warm saline baths, intermittent hot and cold baths, hot air baths, electricity, diathermia, and subcutaneous injections of Ringer's, or saline, solutions.

Surgical measures are directed more and more toward methods of vessel anastomosis. Carrel's claim that the circulation in the arteriovenous system could be reversed by arteriovenous anastomosis has been confirmed and disproved by independent workers.

Levings, in his experiment on dogs, found that the further he went from the anastomosis the less arterial blood he found in the vein. In 136 published cases of arteriovenous anastomosis, there were 30 immediate deaths, 11 additional deaths following amputations, and but 26 successful cases. Ligation of the femoral vein for threatened gangrene was first carried out by Lilienthal, who obtained marked clinical improvement in four cases.

The author believes the favorable results obtained in the successful cases of arteriovenous anastomosis is due to three factors: (1) the actual reversal of the blood stream; (2) backing of the blood in the veins, raising the pressure of the capillaries, and thus increasing the nutrition of the tissues (this result is also obtained by the ligation of the femoral vein); (3) the possible correction of the vasomotor disturbance which the author believes is present in all cases except those of senile gangrene, which afflicts the arteries more than the vein and which would certainly be favorably influenced by switching the blood stream.

In conclusion, the author pleads for early arteriotomy in cases of embolism. The condition is easily recognized and if, instead of waiting for the line of demarcation to form and then amputating, the surgeon would perform an arteriotomy and remove the embolus, many limbs could be saved.

ELLIS FISCHEL.

Jeger, E.: The Technique of Blood-Vessel Suture (*Zur Technik der Blutgefässnaht*) *Beitr. z. klin. Chir.*, 1915, XLVII, 553.

In discussing the difficulties of end-to-end anastomosis of blood-vessels in difficult anatomical situations, the author describes a needle and technique which have materially reduced the hardship and improved the results of the operation in his hands.

After the artery has been dissected out as far as possible consistent with saving the branches, the ends are clamped with broad forceps. The branches are tied off with soft rubber tubing over a slip of

metal, so that the ligature can be cut at the end of the operation without risk to the vessel. Since a single suture will often not permit of exact coaptation of the endothelial rims, the U-stitch of Jensen is used. To make this stitch less difficult, the author has devised a needle-holder which carries two needles parallel to each other and 1 mm. apart. The two needles carry one thread which is threaded on both ends, leaving a loop. The two needles are passed from the outside in on one end of the vessel and from the inside out on the other and then the two parts of the thread are tied, bringing the endothelial edges of the two ends of the vessel automatically into exact apposition. The ends are held by clips until all the stitches are laid and then the tying is done.

M. M. MERRIMAN.

D'Orta, G.: A New Operative Treatment of Edema and Varices of the Lower Extremities Due to Thrombosis of the Femoral Vein. *Internat. J. Surg.*, 1912, xviii, 249.

Thrombosis of the venous circulation of the thigh may be a cause, as well as a result of, varices, particularly a thrombosis of the deeper veins.

Operations intended to remove superficial varices often cause increased edema, cyanosis, and ulceration. The removal of superficial varices in the presence of deep-seated thrombosis means the removal of a compensatory collateral circulation that is needed.

In cases where varices alone exist, without deep-seated thrombosis a total saphectomy after the technique of Madlung or Trendelenburg seems most satisfactory. Where only a small section of the vein is removed a large percentage of recurrences follows. Removal of superficial veins in the presence of thrombosis not only does not cure, but may endanger the extremity or even the life of the patient by stirring up a latent infection.

Biondi's operation consists in arterectomy, a removal of a small section of the superficial femoral artery. This has no deleterious effects upon the viability of the extremity, and the circulatory equilibrium of the limb is established.

This technique was carried out in two cases of septic thrombosis, with perfect functional recovery in both.

J. R. BOGDANSKI.

POISONS

Fleming, A.: The Bacteriology of Septic Wounds. *Lancet*, Lond., 1912, ii, 1046, 1048.

The flora of infected war wounds as determined in this war, differs from that of infected wounds in civil practice. The wounds examined—mostly bullet and shell wounds—were all infected by the projectiles first passing through dirty clothing covered with mud. Shreds of clothing were commonly found in the wounds, and pieces of clothing of considerable size were found in the larger wounds. The presence of blood and contusion in the wound

area augmented the tendency to the development of infection.

The organisms found in wounds are divided in three groups: (1) spore-bearing microbes of faecal origin; (2) non-spore-bearing microbes also of faecal origin; and (3) pyogenic cocci.

The first group includes *Bacillus tetani*, *Bacillus aerogenes capsulatus* of Welch and certain putrefactive organisms referred to as bacilli X and G. The habitat of this group is faecal soil or faecal accumulations from animal and human excreta. The non-spore-bearing organisms of faecal origin are the streptococci, *Bacillus proteus*, and *Bacillus coli* group, the streptococcus being the most important. It is found in nearly all wounds at a late stage. The third group comprises the streptococcus and staphylococcus. The latter is not commonly found in animal faeces, it occurs in the later stages of a wound, and it probably invades it from the surrounding skin in which it is normally found.

The smell of the cultures of bacilli X and G is very putrid; they are gas producing; they are not pathogenic for guinea pigs.

To determine the relationship between the infections in wounds and the bacteria on the clothing, 12 samples of the latter were taken from the wounded on arrival at the base. Pieces an inch square were cut away from the location of the wounds and were planted into broth tubes and cultivated aerobically and anaerobically.

Bacillus aerogenes capsulatus was found in 10 of the specimens; *Bacillus tetani* in 4; streptococcus in 5; and staphylococcus in 4.

From a study of the bacterial flora of the wounds one recognizes three phases. If we take a compound fracture of the femur during the first week, the discharge is a dark reddish-brown fluid, foul-smelling, consisting of blood more or less altered by the growth of faecal organisms which constitute the primary infection. In this stage, the spore-bearing anaerobes and streptococci are mostly present. The second phase represents a transition between the primary anaerobic infection and the infection with pyogenic cocci when the discharge becomes purulent, next less marked, and finally disappearing altogether. This stage lasts from two to three weeks. The third phase is at the end of the third week during which the faecal elements of infection disappear and we have a simple infection of pyogenic cocci, staphylococci, and streptococci.

A bacteriological study of a number of severe wounds shows that the *Bacillus aerogenes capsulatus*, associated with the streptococci and a few staphylococci, albus, produce gas gangrene on about the third day. The bacillus of Welch is the most prominent organism in the pus until the eighth day when culture bacilli, like proteus and typhymyces appear in the wound. A few welch bacilli may persist in the wound until the thirty-second day.

The author finds that there is no difference between

able in the flora of wounds with gas gangrene and those in which there is no clinical manifestation of this infection. The onset of the infection by the welch bacillus is not so much due to the nature of the infection as it is to the mechanical condition of the wound, such as the presence or absence of free drainage.

The tetanus bacillus was found in the clothing of the wounded soldiers and in a large number of the discharges from the wounds. In most of these cases the wounds were serious, with heavy infection from other organisms. It was found in company with the welch bacillus in wounds showing infection from the latter, and a few of such cases actually developed into tetanus.

Blood cultures from a number of compound fractures with persistent high fever were made, and in 25 per cent of such cases a streptococcus was isolated. Streptococci, as already determined in civil practice, are responsible for septicæmic conditions. In one case a pure culture of bacillus coli was isolated. The streptococci recovered from the blood were all of the "streptococcus longus" type.

One striking feature of the discharges from the wounds was the extraordinary amount of phagocytosis. It was uncommon to see pus in which large numbers of the organisms had not been appropriated by the leucocytes. Cultures from this pus were found quite sterile, showing that the leucocytes had not only ingested the cocci, but had apparently killed them. This phagocytosis leads one to believe that the resistance to infection in war wounds is very great, as compared to the resistance found in infection in civil practice, where infection occurs more or less spontaneously in individuals possessed with lower resistance. In civil practice it should be remembered that the infecting agent has often acquired increased virulency in passing from one individual to another; whereas, the virulency of the agents infecting war wounds has been more than likely attenuated by the unfavorable surroundings under which they were existing, the severity of the wound infections being merely the result of the destruction of tissues marked by the presence of laceration, contusion, etc., which furnish an admirable culture medium for the bacteria out of reach of the natural protective forces of the body. It is suggested by the author that if all devitalized tissue could be completely removed infections would sink into insignificance. Since this cannot be done it is incumbent to practice efficient drainage, remove blood-clot, and do all that is possible to diminish the amount of culture medium upon which the bacteria are developing. Along with this wound treatment the patient's resistance should be maintained at a high level by the administration of an appropriate vaccine. In this connection Fleming thinks that it is of advantage to administer in every case of infection streptococcus vaccine in small doses of about 1 to 5 millions every five or six days.

LOUIS A. LAGARDE.

Wintz, H.: The Antitoxin Content of the Serum of Tetanus Patients (*Untersuchungen ueber den Antitoxingehalt im Serum Tetanuskranker*). *Muenchen med. Wchnschr.*, 1915, lxx, 1564.

Wintz describes his experiments on mice, in which he injected tetanus toxin and the serum of tetanus patients to see if the latter had any antitoxic effect. He found that the serum of tetanus patients contained antitoxin that was capable of neutralizing tetanus toxin *in vitro*. The amount of antitoxin varied with the stage of the disease, seeming to be greatest in the beginning of convalescence. An amount was found that was protective, but not curative for mice. Practically, however, the amounts are so small that they give no hope of being effective in treatment.

A. Goss.

Kocher, T.: Treatment of Tetanus (*Zur Tetanus-Behandlung*). *Cor.-Bl. f. Schweiz. Aerzte*, 1915, xlv, 1240.

Kocher says there are three things to be considered in the treatment of tetanus: the care and disinfection of the wound as a prophylactic measure, the prophylactic injection of antitoxin, and the use of magnesium sulphate after the disease has developed. He describes three cases of his own. One of the patients, an adult, died of pneumonia after the tetanus was controlled, while the other two, both children, recovered. One extremely severe case in a boy of 10 had had an incubation of six days and no prophylactic injection of antitoxin had been given. In order to control the convulsions four injections of the magnesium sulphate had to be given the first day, three a day from the second to the tenth day, and one a day from then on till the eighteenth day, the total amount given in the eighteen days being 315 gm.

The chief object of the magnesium sulphate treatment is to gain time until the body can form antibodies to overcome the tetanus toxin. Meltzer and Auer found that the maximum dose was 1.5 gm. to 1 kg. of body weight, but Kocher finds that by giving it in fractional doses throughout the twenty-four hours this amount can be given on from six to eighteen successive days without doing any harm. The severer the case the larger initial dose is given, and it may be well to give it intravenously for quicker action.

From his experience Kocher has come to the conclusion that it is not necessary to give the full dose recommended by Meltzer and Auer for producing complete relaxation of the muscles; it is sufficient to reduce the excitability of the centers to such an extent that the convulsions stop, even though some stiffness persists. In giving a dose large enough for this purpose there is practically no danger of producing paralysis of respiration. This is explained by the fact that the hyperexcitability of the nerve-centers that produces convulsions is overcome sooner than their capacity for reaction to physiological stimuli. Large amounts of sulphate can be given because it is excreted very rapidly, most

rapidly after intravenous injection, next after intramuscular, and slowest after intraspinal injection.

The action of antitoxin is prophylactic, that of magnesium sulphate symptomatically curative; therefore Kecher recommends the subcutaneous injection of 10 ccm. antitoxin on the first, fifth, eighth, and twelfth days after an injury. As soon as any signs of tetanus develop a subcutaneous injection of 25 per cent magnesium sulphate is given, the amount depending on the weight of the patient. This generally has to be repeated four times the first twenty-four hours. Careful watch of the patient must be kept so that the additional doses may be given at the proper time. If the subcutaneous administration is not effective then it should be given intramuscularly. Straub gives it intravenously, but this involves some danger to the heart. It may also be given intraspinaly. In giving it by this method the patient lies flat on his back with only his head, not his neck, resting on a pillow. If the thoracic muscles do not relax the head should be lowered, and if necessary the whole body inclined downward. This causes deep narcosis, which is useful, but it increases the danger of arrest of respiration. A Meltzer apparatus is kept ready for use, but oxygen is used instead of air. If the patient is carefully watched there is little danger of respiratory arrest, and the heart is not affected at all. A. Goss.

SURGICAL THERAPEUTICS

Pinard, A.: Treatment of Wounds with Delbet's Solution (*Quelques observations relatives au traitement des plaies par la solution du Professeur Pierre Delbet*). *Bull. Acad. de méd., Par.*, 1915, 100V, 377.

Delbet has shown that a solution of 12.1 parts of anhydrous chloride of magnesium to 1,000 of water causes an enormous increase of the phagocytic action of the leucocytes, not only *in vitro* but to a still greater extent in the living body. His experiments also showed that the solution is not toxic nor irritating to the tissues.

Pinard thought that practically it would be better to use the crystalline form of the chloride as the anhydrous form is extremely deliquescent. He found that 17.25 gms. of the crystalline form is equal to 12.1 gms. of the anhydrous form, so he made his solution of 17 gms. crystalline magnesium chloride and 1,000 gms. sterilized water. Since October he has given up the use of antiseptics entirely and has treated his wounds solely with this solution. The wounds were all suppurating when they came into his hands. He irrigated them with the solution of magnesium chloride and then covered them with gauze wet with it. For the first five days the wounds were dressed twice a day, after that once a day. The results were very satisfactory, much more so than in the previous months under the use of antiseptics. The suppuration generally stopped

within a few days and the temperature returned to normal. The author recommends the use of this solution to the exclusion of antiseptics. A. Goss.

RADIOLOGY

Knox, R., and Caulfield, A. St. G.: A New Therapeutic X-Ray Localizer. *Arch. Radiol. & Therap.*, 1915, 33, 176.

The authors point out that while the more modern tube stands are of very great use in superficial therapy, yet there are great handicaps when deep therapy is attempted with them.

Attempts have at times been made to substitute moving tubes and complicated apparatus devised to overcome the difficulties.

The employment of X-rays for the localization of foreign bodies directed the author to enquire as to the practicability of employing the central ray of the focus tube in therapeutics, the object being to direct the ray to a definite spot in the interior of the body. In an apparatus which the authors describe in detail the central ray is located, the tube fixed to the stand, and by mechanical adjustment the rays may be projected into the interior of the body with an accuracy which the authors say is as surprising as its projection is simple. The principle on which the apparatus is based is that of the rotating tube, making a circle upon the surface and focusing the rays upon a point in the interior, the depth of which is determined by the angle at which the tube box is fixed.

The authors claim that by this apparatus deep-seated, malignant, and other conditions can be attacked much more easily, readily, and effectively than by the methods now followed. They foresee a large and widening scope for its use.

HOLLIS E. POTTER.

Jordan, A. C.: Fluorescent Screen Localization by the Parallax Method. *Arch. Radiol. & Therap.*, 1915, 33, 188.

Jordan describes his method for the accurate localization of foreign bodies by the parallax methods in screen observation. The screen is placed horizontally upon the part of the patient to be examined. The localizer consists of two uprights, one on either side of the patient. In each upright is a pointer which can be moved up or down by a sliding sleeve. Adjustable clamps fixed on the uprights carry the weight of the screen.

The screen is so adjusted that the shadow of the pointer is in a straight line with the shadow of the foreign body. The direction of the shadows should be parallel with the side of the rectangular diaphragm of the tube box. The tube (with its box) is then moved under the patient and the corresponding movements of the shadows on the screen observed. If the pointer and the foreign body are at the same depth below the screen their shadows will move together, and will be in a straight line in all positions of the tube. If the foreign body is deeper

or more superficial than the pointer the shadow will move more rapidly or less rapidly as the case may be than that of the pointer, and by adjustment of the pointer the exact depth of the foreign body below the screen may be ascertained.

HOLLIS E. POTTER.

Heimann, F.: Deep Action of Radiotherapy (Zur Strahlentiefenwirkung). *Berl. Klin. Wochenschr.*, 1915, lii, 1310.

Heimann discusses the brilliant results recently reported by Bunum and Warnekros and others of the Berlin school from the use of extremely high doses of roentgen rays, as much as 400 X or more being given in one series over each skin area. Heimann does not advocate the use of such large doses. He ordinarily uses from 50 to 100 X with tubes of 12 Wehnelt hardness, 3 mm. aluminum filter, and 20 to 22 cm. focus-skin distance. In a few cases that proved refractory he used the large doses recommended above, using the same technique in other respects, and quite serious injuries of neighboring organs resulted. Both roentgen rays and radio-active substances produce these injuries when given in such large doses.

As a proof that his usual smaller doses of 50 to 100 X are effective Heimann gives a microscopic description of the skin and of the cancer-cells in two cases of carcinoma of the vulva. The skin was not injured, while the cancer-cells were completely degenerated and surrounded by a zone of lymphocytes. The small cell infiltration had penetrated even into the cancer-nests. The structure of the cancer-cells could not be made out. He has had equally good results in other cases of carcinoma of the uterus. It is true that some cases are refractory, as the sensitiveness of the cells to the rays is different in different cases. But these refractory cases will not be cured, even if extremely large doses are given, while the patient is subjected to the danger of the by-effects mentioned above.

A. Goss.

Lazarus-Barlow, W. S.: The Cause and Cure of Cancer in the Light of Recent Radiobiological Research (Die Ursache und die Heilung des Krebses im Lichte der neueren radiobiologischen Forschung). *Strahlentherap.*, 1915, vi, 175.

Hitherto different diseases have been collected under the name of cancer, and many causes assumed for its origin. Now it is generally accepted that chronic inflammation is the only cause. Local abnormal irritation of a cell is the cause of the growth of cancer. And one agent in the causation of cancer is the stimulation which radium rays, for instance, may exercise on the cell.

In support of his thesis the author makes the following assertions:

1. Radium is present in such quantities in nature that cell division may be hastened by it. Many kinds of cells are capable of this increased rapidity of growth if the right dosage of rays is used. Many

experiments were made. For example, the author and Dunbar irradiated a muscle nerve specimen of a frog with radium bromide. Under the influence of the α , β , and γ -rays the nerve lived longer and reacted to stimuli longer than the non-irradiated control nerve.

2. Bacteria suspended in a radium-containing fluid take up radium. This assertion is based on experiments made with staphylococcus aureus, and the author concludes that when radium gains access to the circulation it increases bacterial activity.

3. The Altmann's granules that are present in the normal cells and lacking in the malignant tumor-cells are dissipated by radium treatment, so that the cell comes to resemble a cancer-cell.

4. Radium may occur in normal tissues, but in less amount than in cancer tissue.

5. Roentgen rays may produce carcinoma of the part irradiated, as shown in the cases of about 100 surgeons and roentgen workers who had been using the rays for 4 to 14 years. No cases of radium cancer are yet known, but it is probable that they may be produced by radium when we consider the great similarity between the γ -rays of radium and roentgen rays.

Taking up the question of the cure of cancer the author shows that —

1. Radium in sufficient doses is capable of killing every kind of cancer-cell. He has confirmed this assertion by numberless experiments. For example he found that the ova of ascaris, which are particularly resistant to chemical agents, can be killed in 10 seconds by the α , β , and γ -rays of 7 mg. radium bromide.

2. The different cells are not influenced to the same degree by the rays; their elective effect is shown for example in herpes tonsurans, where a certain dose causes the hair to fall out but the epidermis is not injured; or in case of the ovaries and testicles where the rays produce sterility without causing any direct injury to the surrounding tissues. And it is in this elective effect that the greatest significance of the rays lies. By irradiation of malignant cells an active immunity is brought about. The author thinks this is the most important point in radiotherapy, for if the cancer-cells can be brought by means of the rays to produce specific antibodies for similar cancer-cells, the cure of cancer will be very much furthered.

Morson reports that in treating a mouth carcinoma with radium rays the carcinomatous glands in the pharynx were favorably affected and he believes this was due to the formation of antibodies by the cancer-cells of the mouth carcinoma.

Blumenthal injected the expressed juices of an irradiated primary cancer into a secondary nodule and caused it to disappear.

The practical conclusions from the author's work are as follows:

1. In every case the treatment must be preceded by careful microscopic examination in order to make sure of the differential diagnosis. The author

attributes special importance to the demonstration of Altmann's granules.

2. From time to time the radium should be tested as to its own strength.

3. The irradiation disseminates in the body masses of dead, dying, and disorganized tissue, which may cause a fatal result. Therefore in cases that have been rendered operable by irradiation, operation should not immediately follow the radiotherapy.

4. The mass of carcinomatous tissue should not be completely removed before irradiation, for in this way the body is deprived of the action of the antibodies formed by the old cancer cells.

5. In radium we have an excellent means of treating inoperable cancer, and it should be used in all cases where radical operation does not promise good results.

A. Gross

Perkins, C. W.: The Fluoroscopic Screen and the Radiography Plate in the Diagnosis of Medical and Surgical Lesions of the Alimentary Tract. *Med. Rev.*, 1913, LXXVIII, 639.

Perkins thinks that there is no need for the useless controversy between the screen enthusiasts and those who favor the serial plate method of diagnosis. The signs of gastric and intestinal lesions can be recognized by either one or the other. One method supplements the other and the skillful use of the screen removes the necessity of many plates, thus avoiding expense and labor in the laboratory. In any event diagnosis should not rest on the X-ray findings alone. The radiologist must be a clinician, pathologist, and anatomist, and should follow his cases to the operating room. Co-operation and teamwork of the clinician, radiologist, and surgeon is what is needed for a positive measure of success.

Perkins asserts that the problem of identifying a tumor within or without the stomach or intestines is impossible by any other method of diagnosis than the X-ray, owing to the ability to move the viscera, indent them, locate pain-points and adhesions within a flaccid abdomen, while the shadow is visible on the screen.

Discussing the X-ray findings in gastric ulcer Perkins says that while many have held that the incision or spasmotic indrawing of the greater curvature is a positive sign of gastric ulcer he has personally noticed it in a case of old callous ulcer of the pylorus with dilatation. In fact this symptom may arise from any point in the gastric or duodenal region. True incision indicative of ulcer may be closely resembled by other phenomena and a hasty conclusion must be avoided.

In some cases of ulcer the usual signs are absent, especially in cases of the florid type in the pars pylorica and in the stomach wall. The clinical evidence will in such cases clear up the diagnosis.

While the cinematograph serial method is a serious rival of the screen examination, the expense involved is a bar to its general adoption. Moreover,

the localizing of adhesions and pain points by palpation with the patient standing or recumbent, which is always part of a screen examination, is certainly impossible by the serial plate method.

The author thinks that with the exception of gynecological diseases, the roentgen ray will largely displace the exploratory operation.

HORACE E. PETER.

Iselin, H.: Roentgen Examination of the Shoulder in Two Directions Parallel to Each Other (Die Roentgenuntersuchung der Schulter in zwei zueinander senkrechten Richtungen). *Beitr. z. klin. Chir.*, 1913, XXX, 473.

Iselin points out the importance of taking roentgen pictures in this way in recognizing fractures of the neck of the humerus, the acromion and coracoid processes. One picture is taken from before backward or vice versa, the other from the axilla upward; this is better than the picture taken from above downward. A fracture displacement may not show in the anteroposterior picture but it may be caught in the vertical one.

The details are given of a case of bullet in the shoulder for which two incisions had been made unsuccessfully. By means of the two perpendicular pictures the bullet was accurately localized and removed without any trouble. It was important in this case that the bullet should be removed, as it was pressing upon a branch of the infraspinatus nerve. Iselin also describes a simple method of determining the depth of a projectile from these two pictures.

A. Gross.

Treber, H.: Changes in the Blood Caused by Radiotherapy (Veränderungen des Blutes durch Röntgentherapie). *Strahlenther.*, 1913, VI, 398.

The author reports the blood findings in 33 cases of carcinoma that he treated with mesothorium, the blood count being taken before and after the irradiation. In 24 cases, or 73 per cent, the hemoglobin content increased 10 to 15 per cent, and in 1 case 20 per cent. In 6 cases, 18 per cent, there was no change in the hemoglobin content and in 3 extremely bad cases there was a decrease in hemoglobin. In all cases there was an increase in the number of erythrocytes. In contrast to this increase in red cells and hemoglobin there was a fall in leucocytes. In 22 patients, or 67 per cent, there was a decrease, and in 6, or 18 per cent, there was a fall from normal to less than 4,800. The size of the dosage of mesothorium did not seem to have any special effect on the blood picture.

In roentgen treatment Treber found that the higher the dosage the greater the fall in leucocytes. He examined 10 patients, some of them carcinoma and some myoma cases. After about seven treatments there was a decrease in the leucocytes. There was also a rise in the red cells and hemoglobin, but there was probably a second factor involved in this, that is, the formation of the hemorrhage as a result of the treatment.

A. Gross.

St. Clair, R.: Radium Treatment of Malignant Tumors. *West. M. Times*, 1915, XXXV, 89.

The author reports some cases to show the value of radium treatment as a prophylactic against recurrence, subsequent to a radical operation for malignant tumor. Two of these cases were advanced uterine carcinomata in which at operation it was found impossible to entirely remove all the involved structures. In the first case radium treatments with a 10 mg. tube were given. The treatments were continued at increased intervals for three weeks, much longer exposures being given in the later treatments. At the time of report, fourteen months later, the patient seemed to be in perfect health and there were no indications of a recurrence. In the second case, in which the fundus was involved and removed, the patient received six twenty-four-hour treatments of a 10-mg. tube, the treatments being given at intervals of six to eight days. The menstrual flow ceased after the second treatment, and has not been renewed. At present the patient looks healthy and well, though the time elapsed is too short to report her as cured.

The third case was that of a man whose left leg was amputated for sarcoma. Numerous large nodules showed in the stump after two weeks. He received twelve treatments, of from sixteen to thirty hours' duration each, at intervals of from three to five days. The discharges became progressively less and ceased after a month. He seems perfectly well and has no trouble with the stump.

HOLLIS E. POTTER.

Heilbron, L. G.: A Few Remarks on the Use of Intensifying Screens in Radiographic Work. *Arch. Radiol. & Electrotherap.*, 1915, xx, 120.

Heilbron, who writes from the X-ray Institute of the University of Amsterdam, reports results with the use of intensifying screens, which are more or less in contradiction to the opinions of several leading roentgenologists. While the use of very low-vacuum tubes is one method of getting contrast on the radiographic plate, yet some parts of the body do not allow of an examination with very low-vacuum tubes. In these cases such large quantities of X-rays would be needed on the surface of the body to get sufficient X-ray energy on the plate that there would be some danger to the patient. The greatest advantage found in the use of intensifying screens lies in the possibility of using tubes with much lower vacuum than without the use of a screen.

In kidney work the opinions of several authorities regarding the use of intensifying screens is unfavorable. Albers-Schoenberg's opinion being that "in kidney stones they are not to be recommended." Heilbron's experience, however, is absolutely opposed to this, as even in very lean persons a sharply defined shadow of the kidney is obtained on the plate. The technique of the method for this class of work is described in detail.

Although the use of intensifying screens is fairly

general now in radiographic work connected with the alimentary tract, yet the desirability of its use in the examination of the osseous system is not so well recognized. For such, and particularly for transversal and sagittal radiographs of the head the use of the intensifying screen cannot be too highly praised. Moreover the tubes have a much longer life.

The article is illustrated with some fine examples of plates taken with the intensifying screen.

HOLLIS E. POTTER.

Fischer, H.: Radiology of the Movements of the Diseased Stomach (Beitrag zur Radiologie der Bewegungsvorgaenge am kranken Magen). *Mitt. a. d. Grenzgeb. d. Med. u. Chir.*, 1915, xxviii, 843.

Fischer gives the histories of 10 cases in which radiography showed alternating periods of abnormally active peristalsis and complete lack of peristalsis. Four illustrative cases are cited, all but one of which were cases of ulcer of the duodenum or pylorus or cicatricial stenosis resulting from such ulcers. In three of the cases clinical examination showed normal motility of the stomach, while radiography showed delay in the emptying of the stomach. It seems that in some cases after periods of very active but ineffective peristalsis with the pylorus closed, periods of apparently inactive peristalsis set in, during which part of the stomach contents is pressed out through the pylorus. As these abnormalities in peristalsis show on the roentgen screen before they give any clinical manifestations, repeated or long continued roentgen examination may call attention to disturbances in the motility of the stomach.

A. Goss.

O'Brien, F. W.: Roentgenoscopy (Fluoroscopy) Versus Serial Roentgenograms. *Intern. M. J.*, 1915, xxii, 1048.

O'Brien criticizes the attitude taken by Barclay and Carman in assuming that screen examination in roentgenology is the only correct method for diagnosis of conditions of the alimentary tract.

Accurate diagnosis is the only criterion that the physician regards, and he is not concerned with the method used by the roentgenologist, provided the results are accurate. The objections that serial plates are expensive or that screen examination is dangerous to the operator are not tenable if exact diagnosis is the desideratum. O'Brien quotes Case, the recognized representative of the Continental School in America, as declaring that while he preferred roentgenoscopy, yet because of its limitations he was forced to use serial plates to arrive at a correct diagnosis in large subjects and to rule out unsuspected gall- and kidney-stones and early carcinoma. Case also says that in heavy patients the screen findings, with reference to the pylorus, are undependable; and that one must make a series of plates in order definitely to determine the normal elasticity of the gastric walls in the pars pylorica.

The diagnosis of duodenal ulcer is however the

great battle ground between the two schools. The roentgenoscopic school in its diagnosis relies upon a symptom-complex, which in the main is that first described by Holzknecht. O'Brien again quotes Case as warning against the unreliability of this symptom-complex: "As a matter of fact the symptom-complex method is unnecessary since serial radiography and, when necessary, cinematography afford us a means of studying intimately the contractility of the entire gastric wall and of excluding even very small indurating lesions."

O'Brien points out that only 32 to 66 per cent of duodenal ulcers are diagnosed with the screen, while those who use plates claim as high as 90 to 95 per cent correct diagnoses proved at operation. He further believes that roentgenoscopy is inadequate in the diagnosis of the more important conditions of the alimentary tract. It is useful for rapid work in thin or medium-sized patients only. It is impossible to diagnose gall- and kidney-stones by it directly unless they are gross, and early lesions of ulcer or carcinoma are overlooked. He strongly favors the use of serial plates.

HOLLIS E. POTTER.

Lange, S.: Cause and Prevention of Constitutional Symptoms Following Deep Roentgen Therapy.
J. Am. M. Ass., 1915, lxx, 1906.

Lange refers to the unpleasant symptoms which very frequently show in patients who have submitted to the massive deep dose in roentgen therapy. Nausea, lack of appetite, and even vomiting may occur from two to six hours after the treatment and may persist for days. The weight and strength of the patient may decrease and the condition become so alarming that the patient will discontinue treatment. While such symptoms do not usually occur with lesser dosage, yet the lesser dosage fails to accomplish the results desired. From a study of the matter, and a desire to obviate the unpleasantness, Lange concluded that such symptoms were the result of an acidosis, either local or general. It is known that the reaction produced in the skin is a local acidosis from cellular disintegration. That the nausea is not the result of unpleasant odors is quite clear as there is no immediate nausea after treatment. Clinical tests proved the correctness of the theory. The administration of sodium bicarbonate in 30-grain doses every three hours for twenty-four hours previous to treatment, and for forty-eight hours after, obviated any unpleasant symptoms in a patient on whom the effects were greatly feared.

Lange now prescribes this medication as a matter of routine. The use of alkaline waters and alkaline skin lotions is also advised.

HOLLIS E. POTTER.

Brunzel, H. F.: Treatment of Actinomycosis with Roentgen Rays. *Kasualistischer Beitrag zur Behandlung der Actinomycose mit Röntgenstrahlen.*
Strahlentherapie, 1915, ii.

In addition to the surgical treatment of actinomycosis American authors have for some time been

using roentgen rays with good results. The first report of the use of roentgen rays in Germany for the treatment of actinomycosis was by Richard Levy.

Thus far only 8 cases of actinomycosis cured by roentgen rays have been reported in Germany and in 6 of these the treatment was combined with surgery. The curative effect is produced primarily by the production of an artificial roentgen erythema, with partly filtered and partly unfiltered rays. The author thinks this method of treatment is especially adapted for actinomycosis, but proposes a combination of surgical excision into normal tissue and after-treatment with roentgen rays and iodine. He shows the curvative effect of the roentgen rays in a case of abscess of the sublingual gland which was later shown by microscopic examination to be actinomycosis. The patient had been operated on unsuccessfully several times; after the use of two erythema doses he was completely cured.

Good results have recently been obtained with radium rays also. The author reports a case of Heierdahl's in which 4 cg. of pure radium were applied for three days to an actinomycoma beneath the right eye; there was complete cure in two months.

A. Goss.

MILITARY SURGERY

Wilms: Treatment of Tangential Wounds of the Skull (*Richtlinien in der Behandlung der Schadel-tangentialverwundungen*). *München. med. Wochenschr.*, 1915, lxx, 1437.

Tangential gunshot wounds of the skull demand early and thorough operation; fragments of bone should be removed and crushed, and softened parts of the brain carefully washed out with salt solution. Gauze strips wet with balsam of Peru should then be laid on the exposed brain to prevent infection. The treatment is very effective, as shown by the author's four years experience with it. If operation is performed at once there is only the local injury of the brain to deal with, there is no increased intracranial pressure, but by the second day there is a diffuse edema, which, even if it is not infected, tends to produce a prolapse. If operation is delayed this long a larger opening has to be made in order to provide for the discharge of the exudate, and it is more difficult to wash out the softened parts of the brain, for it is hard to distinguish them from the surrounding edematous brain tissue. Of course the situation will be still more complicated if the exudate is inflammatory in nature. Wilms' work has been in a home hospital and he has had frequent occasion to see the bad late results of cases that were not promptly operated upon.

Puncture should not be performed for the sake of locating a brain abscess. New infection is introduced by the puncture needle as often as the abscess is located. Abscesses must be located by free incision, and this is especially true of the abscesses from tangential injuries, which generally lie very near the surface. In case of prolapse, which in-

dictates increased intracranial pressure, extensive trephining must be performed. Wilms does not believe that gaps in the skull should be closed by plastic operation, at least not until a year or more after the injury, for the patient is for many months subject to the danger of late effects from the wound, and it should not be closed up by plastic operation.

A. Goss.

Schroeder, H.: Treatment of Injuries of the Jaw in Military Hospitals. (*Zur Behandlung der Kieferverletzungen im Feld- und Kriegslazarett.*) *Beitr. z. klin. Chir.*, 1915, XLVII, 320.

Among the various kinds of apparatus which the author has had occasion to use in cases of fracture of the jaw he prefers the Sauer wire splint with or without inclined planes. In cases of extensive loss of substance artificial jaws of hard rubber give excellent temporary service. The injuries described were produced by grenades, shrapnel, and rifle bullets.

Fourteen case histories are given, comprising examples of all sorts of injuries of the jaw. In one case no splint was necessary because the fracture lay within the insertion of the masseter, so that the bone was fixed by this muscle; there was one case of double fracture of one side of the jaw; two cases of fracture of both halves of the lower jaw; one case in which the projectile passed through both sides of the jaw, but produced fracture only on one side; two cases of very extensive loss of substance on one side; one case in which the bullet entered the open mouth and produced two smooth, vertical lines of fracture on one side of the lower jaw; one case of extensive crushing of the bone, so that an immediate prosthesis had to be supplied; one case of injury of the alveolar process of the upper jaw; two cases of fracture of both upper and lower jaws, and a case of hopeless crushing of both jaws.

The mortality, the author thinks, is higher than that for similar injuries in peace. Often the surgeon cannot operate so soon as would be desirable on account of the general condition of the patient. Tongue injuries are rare.

A. Goss.

Holmes, G., and Sargent, P.: Injuries of the Superior Longitudinal Sinus. *Brit. M. J.*, 1915, ii, 493.

Of the many valuable contributions on gunshot wounds of the head that have been published since the beginning of the present war, one of the most original and valuable comes from Holmes and Sargent. The authors draw attention to a new type of vascular lesion in the brain which is frequent as a result of glancing and superficially penetrating wounds about the vertex of the skull from trench fighting where the head is more frequently and longer exposed than the rest of the body.

The vascular lesions of the brain seen in civil practice are commonly due to arterial disease, to thrombosis, hæmorrhage, or embolism, while initial

affections of the cerebral veins are uncommon. Injuries to the latter are common with tangential shots from the great penetrating power of the military rifle. Disturbances of the cerebral venous circulation are frequent from depressed fragments of the skull in the nearby cerebral veins, and these clinical effects are most striking when the cranial sinuses into which the cerebral veins flow become involved. Since the vertex of the skull is such a constant target in trench fighting the superior longitudinal sinus is by far the most frequently involved of the cranial sinuses. The most common type of injury is gutter or tangential wounds at the middle line of the head, which may be sagittal, coronal, or oblique in direction. In such cases there may be injury to the longitudinal sinus itself or to its tributary veins with or without injury to the adjacent brain tissue. Such a lesion is usually followed by thrombosis of the longitudinal sinus, its venous lacunæ, and the superior cerebral veins.

The symptoms vary with the location and extent of injury received. There is an unusual distribution and type of palsy, a constant rigidity, and curious disturbances of sensation. Referring to the paralyses, out of 78 patients 30 had all the limbs involved; 31 had both legs and one arm affected; 16 suffered paralysis of the legs only; 6 suffered from hemiplegic symptoms; and in 5 only one leg was involved. The hands were not so much involved as the arms, and the feet showed a greater degree of paralysis than the legs, which is contrary to the rule in cerebral palsies seen in civil practice. The rigidity was still more striking than the unusual distribution of the paralysis. It was most pronounced in the lower limbs. When the upper limbs were involved the paralysis was greater at the shoulder than at the elbow and it was rarely present and never complete in the wrist or fingers. The onset of the rigidity may be noticed at once, but it usually takes place in the first 24 hours. It does not increase as a rule, and it is apt to diminish with the return of function. The muscles of the trunk may partake of the rigidity so that the abdominal and respiratory movements become feeble. Reflex spasms have been associated with the rigidity. In 10 patients fits were noted, and these were confined to one side in 8 of the 10 cases; the reflexes were increased, and Babinski's sign was present. The sensory changes are said to be those of cortical lesions without shock effect.

The signs and symptoms noted are described by the authors as the "longitudinal sinus syndrome."

Of 37 not operated upon one patient died. Of 30 operated upon 15 died. Seven of the latter had some direct brain injury. The results of operative interference are not promising and the authors find difficulty in deciding upon a proper line of treatment. Cases uncomplicated by laceration of brain substance are prone to improve spontaneously. Operation is specially indicated in a certain proportion of cases, to ward off sepsis and impending complication.

LEWIS A. LAUGHLIN.

Orth, O.: Penetrating Chest Wounds (Penetrierende Brust-Rauchverletzungen). *Beitr. z. klin. Chir.*, 1915, LVII, 544.

The author, after a reference to the necessity for laparotomy in all cases of penetrating or even parietal wounds of the abdomen, cites three cases of penetrating wounds of the chest and diaphragm in which abdominal organs were injured. The symptoms in these cases did not point to injury of the abdominal organs, although laceration of the diaphragm should have been suggestive. He pleads for a careful abdominal investigation in such cases.

M. M. MATTHEIS.

Landois, F.: The Primary Suture for Lung Laceration in the Field (Die primäre Naht bei Lungenzerreissungen im Felde). *Beitr. z. klin. Chir.*, 1915, LVII, 418.

The treatment of wounds of the thorax and lungs depends upon the nature of the projectile and the direction of the lesion.

Smooth gunshot wounds may be handled conservatively at first. If hemothorax sets in later, a puncture may be made, and empyema may be relieved by rib resection. The case is different with those suffering from wounds traversing the lung or with considerable destruction of the thorax who are brought in with open pneumothorax. These patients have a small, fluttering pulse, cyanosis and dyspnea. With these, conservative methods are not to be recommended. The majority of those received at the hospital in this condition have not survived. In these cases, therefore, immediate operation is indicated.

In consideration of these facts, the author and his colleagues have made a practice in open wounds of the lungs of drawing the lung into the thorax wound and sewing it by a circular suture to the musculature, using interrupted stitches. He describes in detail two cases. In both there was severe laceration of the lung with extensive hemothorax. The hemorrhage stopped at once after the sutures were placed—these passing deep through the parenchyma of the lung—and the general condition improved rapidly. Even though empyema later necessitated another operation, the condition of the patients remained satisfactory throughout.

Aside from the immediate relief rendered by this operation, it is of value in preventing a total collapse of the lung if operation for empyema becomes necessary, and it also hinders the formation of a complete empyema. The lung, after such operation, has at least one fixed point from which it can dilate and thus gradually cause the closure of an empyema cavity. On the contrary, it might be suggested that this deep suture through the lung and contaminated wound edges might induce abscess of the lung. The lung parenchyma, however, seems to be very resistant to infection. The author claims he has never seen an infected wound canal in the lung itself. Even if a stitch abscess should form, it could be readily evacuated. When

the lung is badly torn, such stitches are the only remedy for severe hemorrhage. M. M. MATTHEIS.

Morison, R.: A Note on the Treatment of Traumatic Aneurisms Resulting from Bullet Wounds. *Brit. J. Surg.*, 1915, II, 280.

There are a surprisingly large number of traumatic aneurisms. These may appear shortly after the wound or at a later period. The diagnosis is made on the presence of tumor, expansile pulsation, and differences in the pulse in corresponding regions.

The treatment attempted was usually the Matas' operation. This, however, was successful in only a very few cases, and proximal and distal ligation was usually resorted to.

Fifty cases are reported in detail. J. H. SMITH.

Lange: Treatment of Gunshot Wounds of the Abdomen in War (Zur Behandlung der Bauchschüsse im Kriege). *Beitr. z. klin. Chir.*, 1915, LVII, 312.

This article is an answer to a recent article by Roper in which he advocated conservative treatment of abdominal wounds because he says the results of conservative treatment are satisfactory, and moreover the conditions are not such that operations can be performed with any hope of success. Lange replies that the conditions immediately back of the firing line are such with reference to asepsis, lighting, instruments, etc., that very good results have been obtained in operative work, at least while the armies are stationary in the trenches. Moreover, he doubts the reliability of the statistics which show good results from conservative treatment of abdominal wounds, because many so reported are merely wounds of the abdominal wall, and do not involve the intestinal tract; of course such wounds make good recoveries, but they should not be included in the statistics.

From December 15, 1914, to March 1, 1915, the author observed 10 cases of gunshot injury of the abdomen. Four were injuries only of the abdominal wall and all recovered uneventfully. Of 3 patients with intraperitoneal injuries, but without involvement of the intestine, 2 died and the other was discharged without fever after two weeks. Of 3 with intestinal injuries, one was treated conservatively and 2 by operation, but all died. The prognosis is bad with either method of treatment, and the author does not believe that either treatment should become routine, but that each case should be treated according to its special indications, as in civil surgery. A. Goss.

Quénu, E.: Seventy-two Cases of Gunshot Injury of the Abdomen Treated by Laparotomy (Septante-deux observations de plaies de l'abdomen traitées par la laparotomie). *Bull. et mém. Soc. de chir. de Par.*, 1915, XII, 1207.

Quénu reported 46 cases of Schwartz and Mocquot and 26 of Mathieu, in all of which laparotomy was performed. Of the first 46 cases, 4 were simple

penetrating wounds, 29 wounds of one viscus, 13 of several viscera. Among the simple penetrating wounds there was 1 death and 3 recoveries; in the 29 univisceral cases there were 20 deaths and 9 recoveries, or 69 per cent mortality; in the 13 multivisceral injuries, there were 9 deaths and 4 recoveries, or 69 per cent. Considering the intestinal wounds alone there was a mortality of 75 per cent.

In a previous series of abdominal wounds reported by the author, the mortality was only 67 per cent, but in that series the longest time of operation after the wound was five hours and many of the cases were operated on in one hour. The interval in Schwartz and Mocquot's cases was considerably longer, 9 or 10 hours in most and in some over 15 hours. Among Mathieu's cases there were 3 simple penetrating wounds, all of which recovered; 12 univisceral ones with 3 recoveries; and 11 multivisceral with no recoveries. The mortality for the whole series was 77 per cent. This high mortality is accounted for by the fact that the patients were in such a very serious condition when received. Quénu is convinced that none of the fatal cases would have recovered under expectant treatment.

A. Goss.

Penhallow, D. P.: Shrapnel Bullet in Bladder.
Boston M. & S. J., 1915, clxxiii, 664.

The author reports a case of an English soldier wounded in France by a shrapnel bullet. The wound of entrance was in the midline of the back on the level of the lumbar spine. The patient experienced no inconvenience, except that he could feel some object rolling about in his bladder and during urination the stream would be suddenly blocked and could only be relieved by change of position. An X-ray photograph showed a large bullet free in the bladder, which was removed suprapubically with good recovery.

HENRY L. SANFORD

Richards, O.: The Pathology and Treatment of Gunshot Wounds of the Small Intestine.
Brit. M. J., 1915, ii, 213.

The conclusions arrived at by the author are:
1. Death in uncomplicated cases of gunshot wounds of the small intestine is not usually due to the escape of feces and general peritonitis, but to a progressive intestinal paralysis and distention spreading upward from the injured coil.

2. Operation in such a case should include the resection of the injured portion together with as much bowel above it as would otherwise remain in a condition of paralysis. If this be done sufficiently early there is a prospect of saving a fair proportion of cases.

J. H. SKILES

Zahradnicky: Gunshot Injuries of the Large Joints (Ueber Schussverletzungen der grossen Gelenke). *Beitr. z. klin. Chir.*, 1915, xcvi, 452.

Aseptic joint injuries are treated conservatively, the utmost that is done in a surgical way being punc-

ture if there is pronounced effusion of blood or fluid, but in infected joints surgery is frequently necessary. In injuries of the shoulder the upper arm is bandaged to the thorax with a sort of Desault's bandage padded with gauze. The elbow-joint is firmly bandaged at an angle of a little less than 90°. The hip-joint is fixed with splints or a plaster cast. Large serous or hemorrhagic effusions are emptied by puncture if they are not rapidly absorbed. The absorption of fluid is hastened by painting with iodine and compression bandages. If the effusion is suspected of infection the joint may be irrigated with one per cent carbolic acid solution.

Even in infected joints an attempt is generally made at conservative treatment, as it is well known that immobilization often decreases secretion and pain, causes swelling to subside and the temperature to fall. In some cases the joint may be irrigated with antiseptic solutions. If these measures are not effective the joint is freely incised and drained. If this does not succeed arthrotomy is performed, pus emptied from all recesses, and open treatment of the wound instituted. If this is not successful resection must be performed, generally an atypical resection, removing only crushed ends of the bone and fragments. Typical resection is performed only if the joint is very badly damaged or if there is a septic condition which demands resection of the entire joint.

A table is given showing the percentages of operative and conservative cases for different surgeons. The percentage of cases operated upon varies with different surgeons from 4.3 per cent to 95.6 per cent. The author operated upon 28.8 per cent of his cases. The operations were all in infected cases, except one, in which a bullet was removed from a non-infected shoulder. Resection was performed in 25 cases, removal of necrotic bone in 5 cases, arthrotomy and drainage in 11, and amputation in only 2.

As to the removal of projectiles the author believes that all shrapnel and grenade fragments should be removed. They do not become surrounded with connective tissue as do rifle bullets, but form cystic cavities which nearly always have purulent contents. When a projectile is to be removed it should always first be localized with two roentgen pictures taken perpendicular to each other.

He has had in all 200 cases of gunshot injuries of joints, 133 of which were non-infected and 67 infected. He had only 4 deaths from severe sepsis. In a case of hip injury and the other 3 of the knee, making a total mortality of 2 per cent. In the aseptic cases satisfactory function was restored in 79.7 per cent; in 20 per cent there remained either pain or limitation of motion. In the septic cases the functional results were good in only 17.9 per cent of the cases; there was limitation of motion in 69.2 per cent and total ankylosis in 12.9 per cent. These were the results soon after treatment was finished. They will be better as to function after the patients have undergone a course of orthopedic after-treatment.

A. Goss.

Bruns, L.: Indications for Surgery in War Injuries of the Nervous System, and the Prognosis of These Injuries in Themselves and After Operation. (Ueber die Indikationen zu den therapeutischen, speziell den chirurgischen Massnahmen bei den Kriegverletzungen des Nervensystems und über die Prognose dieser Verletzungen an sich und nach den verschiedenen Eingriffen). *Berl. Min. Wechschr.*, 1917, 31, 946.

Bruns reports his experience at a base hospital with 116 cases of injury of the peripheral nerves, 84 of the brain and skull, and 37 of the spinal column and cord.

The injuries of the peripheral nerves he divides into three groups:

1. In the first group the function of the whole cross-section of the nerve is destroyed at the site of the lesion, so that all the muscles supplied by it are paralyzed; there is complete reaction of degeneration in the paralyzed muscles, and sensation in the region supplied by the nerve is more or less disturbed. It is impossible to tell whether the nerve is completely severed or whether it is only embedded in scar tissue. The only way of finding out is to operate, opening up to the nerve and then proceeding according to the findings. Operation should be performed as soon as the wound is healed, any accompanying bone fractures consolidated, and all signs of sepsis disappeared. If during this period of waiting there has been marked improvement in the symptoms, operation may be deferred, in the hope of spontaneous restoration.

2. In the second group of cases only some of the muscles supplied by the nerve are paralyzed, showing that the whole cross-section of the nerve is not involved, but there is complete reaction of degeneration in the muscles that are affected. Operation may be deferred longer in these cases, for the lesion is less severe and they are more apt to recover spontaneously.

3. In the third group the reaction of degeneration is only partial. These cases may be treated by electricity and massage. Neurolysis is especially indicated in those cases where there is severe and long-continued pain. Among the entire number of injuries of the peripheral nerves that Bruns has observed, there has been great improvement without operation in 53. He had great improvement after neurolysis in 13 cases, complete recovery in half of them. He has had successful results from nerve suture in 10 cases.

The lesions of the spinal cord are divided into those in which the whole cross-section is injured, and those of partial injury. In the cases of partial injury operation should be performed only if the roentgen ray shows that fragments of bone or projectiles are compressing the cord, or if septic symptoms demand operation. In the majority of partial injuries operation is not indicated, and the prognosis without it is much better than might be expected. The cases of total injury are often so hopeless that operation is useless. There are cases, however, in which operation should be performed if the pa-

tient's condition permits it, though with or without operation the prognosis is extremely bad.

The skull wounds have mostly been treated before they reach the base hospital; that is, the wounds have been examined and cleaned and fragments of bone removed. These cases should be kept under observation for a long time at the base hospital, for every patient with a brain injury is in danger for a long period. If he develops signs of dizziness, headache, or nausea, his temperature should be taken and the eye-ground examined. If high tension of the pulse or mental dullness intervenes the wound should be opened up and an examination made for brain abscess. If bullets lodged in the brain are superficial they should be removed, for they always subject the patient to the danger of late abscess. If they are deep down they should be let alone, as the danger of exploring for them is too great; but it is often difficult, even with good roentgen pictures, to tell just how deep they are. The author has operated on 11 cases of brain abscess with 4 deaths. After injuries of the cortex, attacks of cortical epilepsy are very frequent. He has not had sufficient experience to say whether operation is indicated for these. The prognosis with reference to mental defect after brain injuries is quite good. Recovery is seldom absolutely complete; for instance, after an aphasia there may remain slight disturbances in reading and writing; but if important association tracts are not involved in the injury the patients recover sufficiently to lead useful and active lives.

A. Goss.

Bradford, J. R., and Elliott, T. R.: Cases of Gas Poisoning Among the British Troops in Flanders. *Brit. J. Surg.*, 1917, 11, 234.

The gas first used was made up largely of chlorine but later bromine was largely used.

The symptoms caused by the gas are due to (1) irritation of the respiratory tract, (2) gastric irritation, and (3) a general toxic condition. Death may be produced early from asphyxia or later from complications. Complications may be referred to the respiratory tract in the nature of bronchitis, pulmonary edema, emphysema, pneumonia, or pleurisy. Heart failure may attend the respiratory complications.

Post-mortem findings show marked congestive changes throughout the respiratory tract with edema, emphysema, and pneumonia. The stomach may show petechial hemorrhage. The kidneys, spleen, liver, and nervous system show marked hyperemia. Vascular changes may cause gangrene in the extremities.

J. H. SALLIS.

Munroe, H. E.: Remarks on the Character and Treatment of Wounds in War. *Canad. M. Ass. J.*, 1917, 5, 962.

Since the introduction of the modern rifle, machine gun, and artillery, the majority of wounds in war are those caused by projectiles of one form or another. These wounds present an appearance

varying from the small punctured wound of the rifle bullet to severe multiple lacerated wounds produced by shrapnel, which are not unlike those seen in civil practice caused by machine and railroad accidents. Bullet wounds at close range produce an explosive effect; that is, the destruction of tissue is greater and the wound of exit is much larger than the wound of entrance. There is no evidence that dum-dum bullets have been used, but the Germans are said to have the habit of inverting the bullet so that the base enters first, causing the bullet to expand.

The destructive effect of these inverted bullets is extensive, the tissues, including the tendons, being severely torn. The effect of a rifle bullet upon bone varies from a punctured wound to severe destruction involving the whole shaft of long bones. The effect of shrapnel bullets does not differ materially from that of rifle bullets. Shrapnel casing, hand-grenades, and bombs all produce irregular lacerated wounds on the surface of the body. On account of the irregular size and shape of the missiles, they produce severe destruction of the tissues. If a vital part of the body is severely injured by shrapnel, the patient usually succumbs on the battlefield.

The sinus produced by shrapnel in the soft tissues requires special consideration. The sinus varies in size in proportion to the size, shape, and velocity of the fragment producing it. The sinus tract is very irregular, as muscle fibers cut at different levels retract unevenly. If the sinus is parallel to the muscular fibers the sheath of the muscle may be torn, causing rupture of the muscle into and obliteration of the sinus tract at different points in its course. This interferes with drainage, and has a tendency to produce a closed cavity, causing the rapid incubation of bacteria. If bone is encountered by the fragment of shrapnel, there will invariably be cavities leading in various directions from the main sinus.

With regard to wound infections, streptococcus have been most frequently found present. Tetanus bacillus has made its appearance in a number of cases, while the bacillus aerogenes capsulatus of Welch frequently produces the much-dreaded gas gangrene.

The obvious treatment is to promote free drainage. This is done by enlarging the wound of entrance, if necessary, and by making a counteropening over the seat of the missile, removing it and cleansing the sinus, a drainage tube being then placed in position. This tube should be of such a size as to lie loosely in the wound so as to permit free irrigation between the tube and the tissues forming the walls of the sinus. Slight superficial wounds are drained with rubber tissue. Gauze packing should be employed on no account.

The use of a hypertonic salt solution, composed of 0.5 per cent sodium citrate and 5 per cent solution of common salt known as Wright's solution, used by the continuous drip method, cleans the cavity, carries away bacteria, and promotes the continuous flow of lymph to the part containing

fresh vigorous leucocytes capable of destroying any bacteria that may be left behind by the salt solution or faulty drainage. After the infection has cleaned up, an aseptic dressing is all that is necessary.

The superficial variety of gas gangrene is treated by freely incising the part and the liberal use of hydrogen peroxide and exposure to air. Lactic acid has proved absolutely useless. The deep variety of gas gangrene is controlled only by amputation of the affected limb. A circular incision is used, the cut surface is left exposed, no sutures being used, and the exposed surface is treated with hydrogen peroxide and salt solution applications.

EDWARD L. CORNELL

Reverchon, H. L., Vignat, and Vaucher: Early Sterilization of War Wounds with Hot Air or Oxygen (Stérilisation précoce des plaies de guerre par l'air ou l'oxygène chaud). *Presse méd.*, 1915, xxiii, 425.

The majority of wounds, especially with shells or shrapnel are followed by serious, and often fatal, infection. The authors have found that this infection can be prevented more effectively than in any other way by the use of hot air or oxygen, oxygen being preferable to air because it can be raised to a higher temperature and acts more rapidly, and is also more active in its sterilization. The wound should first be opened up and cleansed of all necrotic tissue, fragments of bone, clothing, etc., and then while the patient is still under ether the wound should be given a douche of the hot oxygen, so that an eschar is formed over the entire surface of the wound. The wound is then covered with an aseptic dressing which is changed every day.

The after-treatment consists of lavage of the wound with physiological salt solution and douches of hot oxygen. The oxygen should be as hot as the patient can stand it, but should not cause pain, and should be played rapidly over the wound under high pressure. This treatment should be repeated every day for about 15 or 20 minutes. Bacteriological examination has shown that the wounds are sterile after this treatment. They do not present any inflammatory reaction, odor, or suppuration. Repair takes place quickly; the patient's general condition is good; temperature and pulse normal.

Histories are given of 11 cases in which the treatment was used. The few failures were due to the fact that the wounds were not opened up freely enough, so that pockets remained that were not touched. Of course the results are better if the treatment is given early.

A. Goss.

Morison, A. E., and Tulloch, W. J.: The Treatment of Septic Wounds in War by Magnesium Sulphate Solution. *Brit. J. Surg.*, 1915, iii, 276.

The fact that the majority of the wounds in the present war are terribly infected has led to the use of a variety of treatments in the attempt to obtain one giving the best results. The use of magnesium sulphate solution has proved very satisfactory in a

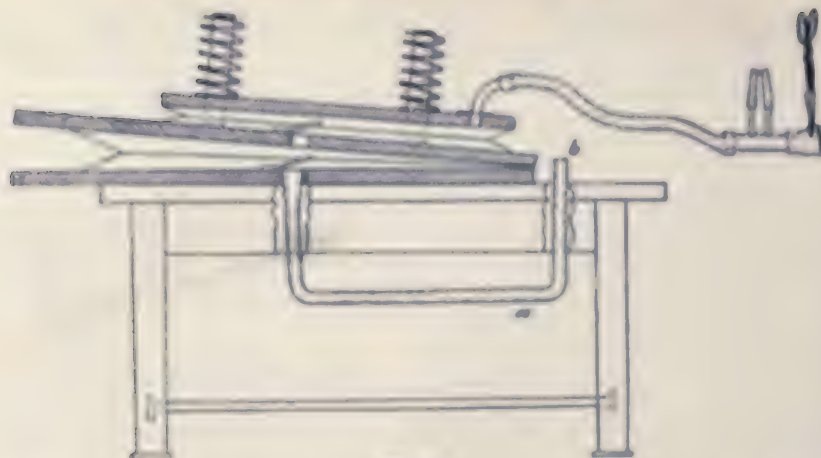


Fig. 1.

large number of cases. A recent wound is thoroughly cauterized with pure carbolic acid. An old suppurating wound is not cauterized. Moist applications of the following solution are then applied: magnesium sulphate, 40 ounces; glycerine, 10 ounces; boiling water, 30 ounces.

Dressings are changed not oftener than once in twelve hours, thus saving the patient much discomfort and trouble. The hypertonic character of the solution aids free drainage of lymph. The solution is not readily absorbed; it does not hinder the growth of granulation tissue, in fact it stimulates such growth, and it has a slight bactericidal property. The dressings are not irritating, in fact they are soothing to the patient. The strength of the solution above mentioned seems to give the best results.

J. H. SMILES.

Jeger, E.: Some Improvised Devices for War Surgery (*Einige kriegschirurgische Improvisationen*). *Beitr. z. klin. Chir.*, 1915, xcvi, 549.

An apparatus for thorax operations is shown in Fig. 1. It consists of a double bellows connected

by a valve and compressed from above by two strong springs. Pumping the lower bellows will deliver a continuous stream of air from the upper under even pressure. The vent of the lower bellows is connected with a metal tube bent twice at right angles, through which the anesthetic is administered. The compressed air is emitted through a hose connected by a metal tube to another hose. The degree of compression of the latter regulates the pressure in the hose. From the metal tube two small metal tubes serve to connect rubber tubing which is fastened into the nostrils by means of zinc paste. The patient's mouth is closed with a suture during the operation.

An apparatus for extension of the humerus is shown in Fig. 2. With this apparatus, the upper arm is rested on an arrangement of metal rods, which are easily removed in order to permit of free inspection of redressing of the wound without interrupting the extension. The apparatus consists of a board *a*, which is fastened to the body by bandages, and two other boards *b* and *c* are fastened to it by hinges. Screws at *e* and *d* fasten the boards at

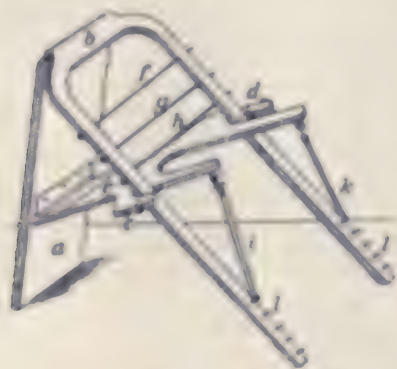


Fig. 2.



Fig. 3.

any desired position. The board *b* is a fork with its branches 30 cm. apart, carrying metal rods at intervals *f g h*. Extension is produced by fastening the ends of *c* by rubber tubing *i k* by hooks *l* on the ends of the fork. The board *e* is suitably upholstered and the lower arm of the patient bandaged to it, with the upper arm resting on the metal rods.

Another apparatus for extension of the humerus shown in Fig. 3 consists of a modification of the Christen apparatus which permits of access to the wounded shoulder and the upper epiphysis of the humerus. The apparatus differs from the original model in that the board *a*, which is bound to the body, and the crossboard *b*, on which the upper arm rests, are connected by a third board *c*. The forearm is fastened as usual to the board *d*. On board *a* is a hook *e* to which is fastened a length of rubber tubing *f*, which by means of a cord and pulley at *g* makes tension on the elbow. To avoid pressure on the elbow and the necessity for long adhesive straps, the elbow is enclosed in a short, well cushioned plaster-of-Paris bandage in which an ordinary bandage is included for attaching the cord. The position of the upper fragment can be influenced by more or less packing of the space between the board *c* and the upper arm. M. M. MATTHIES.

Mayer, E.: Technique of Fixation Dressings (Zur Technik fixierender Verbaende). *Muenchen med. Wchnschr.*, 1915, lxi, 1396.

The author believes that the reason why plaster casts are not more generally used is because most physicians have not been taught the technique of their application. In many clinics their application is regarded as a minor detail and is left to internes or nurses. In military surgery a plaster cast properly put on often saves a limb and sometimes a life. The author has used them with the best of results in his hospital. He describes in detail the technique of putting them on, and points out that one of the chief errors usually made is to make them too short. A cast intended to fix the knee should extend from the hip to the foot, including both, while a cast for the hip should enclose the knee and foot of the injured side and the hip and thigh of the other side, the two sides being connected by a transverse rod. Sometimes in applying a cast to the leg below the knee it is also necessary to include the pelvis, in order to prevent rotation of the injured side.

Following the advice of Koch, in fractures of the leg, the author sometimes places a small Kramer splint transverse to the axis of the leg and encloses it in the plaster so that the leg cannot rotate any more than it could in a Volkmann splint. In the same way in an injury of the arm above the elbow the thorax must be included in the cast. Care must be taken to have the elbow bent at a right angle. If the cast is not padded it is difficult to avoid bed sores. In open wounds windows should be left in the cast large enough to permit of the dressing of the wound and its edges covered with ad-

hesive plaster, while to prevent the rest of the cast becoming wet gauze is pushed in between it and the skin enough to absorb the wound secretion.

The author cited some cases from his hospital which in spite of very severe injuries did not lose their limbs. One patient had almost nothing left of the upper arm but a badly crushed humerus, but he now has a useful arm. In another, about 4 cm. of the femur projected from the wound, but he can now walk around, of course with his cast. Mayer recommends the use of casts in all possible cases and thinks that they should largely replace the use of extension, especially in war injuries. A. Goss.

Hauser: Lessons of the War in Regard to the Organization of the Medical Service (Lehren des Weltkrieges fuer unser Armeesanitaetswesen). *Cor-BL f. Schweiz. Aerzte*, 1915, xlv, 1441.

Hauser points out the necessity of his own countrymen learning from this war whatever lessons are to be gained from the fighting countries. He himself has made personal visits of inspection to a great many of the German, French, and Belgian hospitals, and has also accompanied trains of wounded and prisoners through Switzerland. He believes that the ideal arrangement in caring for the wounded would be to dispense with first-aid dressing stations and transportation, and treat the patients thoroughly at once. This end can almost be attained at times in the stationary trench warfare.

Investigation shows that surgical treatment has become more and more radical at the front since the war began, especially with reference to tangential wounds of the head, abdominal wounds, and injuries of the spinal column and spinal cord. But it is quite different when the armies are advancing. Here the wounded have to be cared for as best they can at first and then carried back to the base hospitals. Both Switzerland and France have a small medical staff for each regiment, while in the German army there is a large medical staff for each division. Hauser thinks the former plan is much better for Switzerland, as it is more elastic and allows of greater mobility, which is very important in a small mountainous country like Switzerland, where the less centralization there is the better the service.

Military hygiene is at least as important in war, if not more so, than military surgery. Unfortunately many of the medical men of the army have not had sufficient training in hygiene. Military hygiene cannot be learned in books, in college, or even in civil practice; it must be learned in handling large bodies of men. When the sanitation officer properly appreciates his duty he can find plenty to do even when few of the men are sick. It is a great mistake not to provide a division or troop with sufficient sanitation officers because there is little sickness. They should be on hand always to see that the men are living hygienically.

Not only medical men but geologists and competent engineers are necessary to protect the health of the soldiers. The geological conditions with

reference to the water supply are very important. Single large hospitals are better than many scattered small ones, as they can be run much more economically. Buildings designed for other purposes, such as school buildings, factories, and hotels can of course be utilized as hospitals when the need arises. Some very excellent hospitals along the French front are installed in such buildings.

Gas phlegmon and tetanus are both much rarer than they were in the beginning of the war. Antisepsis has been shown to be much superior to asepsis, not only in gas phlegmon, but in military surgery in general. Vaccination against typhoid in the various armies has greatly reduced the morbidity from typhoid and the disease is much milder than it formerly was. A. Goss.

A REVIEW OF GUNSHOT WOUNDS OF THE CHEST IN THE PRESENT WAR

BY COLONEL LOUIS A. LAGARDE, MEDICAL CORPS, U.S.A., RETIRED

A REVIEW of gunshot wounds of the chest brings to notice the changes that have come about in recent years through the agency of wound treatment, but more especially on account of the change in armament. The mortality of gunshot wounds of the chest in the Crimean War (French army) was 91.7 per cent; among the English troops it was 70 per cent; among those who survived to reach hospital care in the Civil War, United States, 1861-3, it was 65.3 per cent. With the introduction of the new military rifle firing a steel-jacketed bullet, this high mortality commenced to lessen very materially. In the Spanish-American War it was 21.5 per cent among United States troops; in the Anglo-Bosnian war it was 12 per cent; and out of 145 cases observed at Mankfen by Follenfant, in the Russo-Japanese war, the mortality was found to be as low as 1.67 per cent. Follenfant's cases were studied some time after the injury and the mortality is consequently lower than it would have been had the statistics been culled at the front. Still it should be remembered that the wounds were inflicted by the Japanese bullet, which is but 6.5 mm. in caliber, a reduced caliber bullet smaller than that of other armies, that of the Russian Army being 7.65 mm. In the present European War a larger mortality is expected, since the shell and shrapnel wounds are so much more frequent than they were in all the late wars and, also, a larger mortality is to be expected from wounds caused by the short pointed, unstable Splintz bullet.

The fact that the modern rifle bullet is narrow leads it to pass through the chest at times without injury to important structures which, judging from the external wounds, appeared to lie in its line of flight. Colonel Hale White¹ mentions the marvelous escape of important structures in some of the recent battles. A man was shot through the chest, his left recurrent laryngeal nerve was damaged and yet the vessels were unharmed; and in another instance the only evidence of damage to any other structure than the lung was that the pupil was larger on the injured side than on the other. In another instance a bullet passed through the body of the right scapula

just below the outer part of the spine; it ranged forward and upward through the lung, fractured the sternal end of the right clavicle into several pieces, and emerged at the right sternoclavicular joint, yet it damaged no artery or nerve, as there was no evidence of hemorrhage or paralysis. Another instance of a narrow escape was that of a man hit by a bullet, while waving his arm, at a point on the inner margin of the left deltoid. The X-ray showed the bullet to be lying in the posterior part of the chest six and one-half inches from the skin on the front, behind the superior vena cava; it moved up and down with respiration and from side to side synchronously with the heart. The symptoms lasting one week, were severe pain in the chest, dyspnea, and inability to lie down. On arrival in England his symptoms gradually disappeared at the end of three weeks from the time of injury and he was able to walk about with comfort.

Men who have been hit in the lower part of the chest have also made marvelous escapes. A young man was hit by a bullet close to the sternum in the fifth left interspace. With the X-ray the bullet could be seen to lie in the upper part of the liver near the tip of the eleventh rib or more probably in the deeper part of the abdominal wall. The man was seized with pain when shot but he neither coughed nor vomited any blood. There was dyspnea for a short time. Two and one-half weeks later upon reaching England he seemed to be well without physical chest signs.

The small amount of lesion is dwelt upon by White and yet it should be remembered that the reduced caliber military rifle bullets have always been noted for the small channel which they inflict in lung tissue when they make a regular impact and travel point-on. The elasticity of the lung tissue makes the wounds of entrance and exit appear much smaller than they really are. The contractile property of the tissue, acting as it does in minimizing the amount of lesion, no doubt subdues hemorrhage from small vessels and in that way it causes lung wounds to be classed among the humane injuries in war. It is shown by a study of the characteristic features of wounds caused by pro-

¹ *Lancet*, Lond., 1911, Dec. 2, p. 1213.

jectiles in other parts of the body that resistance on the part of the tissues coupled with sectional area and high velocity on the part of the projectile are the determining factors in the production of destructive effects. The fact that the sectional area of the reduced caliber bullet is so small, and that the lung tissue offers no resistance is probably the principal reason for the humane features observed in chest wounds in a fairly large number of those who reach hospital care. When this class of humane wounds has been reckoned with it should be remembered that no account has been taken of the lesions that were present among those who died a few hours after injury. The dead no doubt suffered injury to the larger vessels about the root of the lung from a regular impact of the bullet but more often from the bullet striking side-on and traveling at a tangent to its line of flight.

The symptoms of perforating gunshot wounds of the chest are extremely variable. They are almost absent in some cases. Shock is only marked in cases with pronounced injury. Usually pain is experienced and yet some patients are hardly aware that they have been hit.

Hæmoptysis is very common. In an extensive review of the subject of chest wounds in the present war, White finds that it was present in 75 per cent of the cases. The amount of blood coughed up is variable, depending upon the size of the vessel damaged. The bleeding stops in a few days in those who reach hospital care. Cough is generally slight and of short duration.

Colonel Sir John Rose Bradford and Captain T. R. Elliott¹ dwell on the change in the characteristic features of the chest wounds observed in the present war as compared to the wounds in the Anglo-Boer War. In the latter, infection of a hæmothorax was a rarity. Makins saw only one case of primary emphysema, and this he attributed to the removal of a bullet which lay underneath the skin. There were, however, a number of secondary emphysemas due to aspiration. Secondary infections were also believed to follow resection of a rib in order to dislodge intrapleural blood-clots. The surgeons were inclined to a most conservative method of treatment.

The present campaign in Flanders has changed all of this teaching. In the Anglo-Boer, Spanish-American, and Russo-Japanese wars the bullet wounds were inflicted at the battle ranges by a well-balanced ogival-headed bullet. The amount of lesion was generally limited. Chest wounds from shell fragments and shrapnel balls were not so frequent. In the present war chest wounds are inflicted by the high velocity bullets at short range, by fragments of shell, or by shrapnel balls. The effusion of blood in the thorax is generally large in amount so that it cannot be left alone. The clothing and skin of the soldiers are fouled with soil and faecal organisms and the result is that primary infection is very frequently introduced into the hæmothorax. Hæ-

orrhage and sepsis are a much more serious matter in the prognosis of chest wounds in this war than in any wars immediately preceding it.

The observations of Bradford and Elliott were made in base hospitals at Boulogne, 60 miles from the front and twelve hours distant by train. The most of the cases arrived on the second or third day, while a few were detained at points nearer the front until the end of the first or even of the second week.

To discover the cause of death, post-mortem examinations were made on 84 bodies. Of these, 60 had an effusion of blood in the pleural cavity; 23 in this group died of complications such as purulent bronchitis, paraplegia, or additional injuries to the abdominal viscera. The remaining 46 died as a result of the hæmothorax. The effusion was found to be infected in 38 of this number and death in all of these was the result of infection. Hæmorrhage was the cause of death in one case on the third day, and this may have been the cause of death in 7 others but the evidence was not conclusive.

Death from simple hæmorrhage is not to be feared if the patient has survived three days, and the authors believe that removal to the base does not involve danger of hæmorrhage when transport is conducted after that date.

In a group of 168 cases made up of mild and severe cases, there were 27 in which the lung was wounded without evidence of effusion. The hæmothorax was sterile in 114 cases and 48 of these were so large — generally 40 ounces or more — that they had to be treated by aspiration. Death occurred in 26 cases with effusion, and 20 of these deaths resulted from sepsis. One died on the third day as the result of simple hæmorrhage of the lungs. There were 48 septic as against 120 sterile effusions, of which 48 were large.

In another group of 160 cases of hæmothorax, in which only the severe cases were recorded, but 5 cases of simple wound of the lung without effusion were noted. The hæmothorax was sterile in 86 cases and of these 41 were aspirated. There were 53 septic cases which survived after resection. There were 21 deaths and the effusion was septic in 16 of these. Again, there was only one death from simple hæmothorax which was complicated by a wound of the heart. The aggregate was 60 septic as against 91 sterile effusions of which 41 were large.

A study of the two groups referred to shows that infection was present in one-third of the cases recorded and that the large effusions were just as often septic as sterile. The chance of infection has to be considered in every case of hæmothorax. The authors believe therefore that the wounded men should be moved, as soon as possible after the danger from hæmorrhage has passed, to a station where the infection can be promptly dealt with. (The reviewer is fully in accord with the authors as to the necessity of moving the patients at once to well-equipped centers where any complication may be intelligently dealt with. The transport should be

¹ Brit. J. Surg., 1915, Oct. 25, p. 247.

as short as possible and conducted most carefully. Whenever the field conditions permit it is much better to bring the necessary equipment and personnel to the patients. Military surgeons generally in all of the recent wars agree that formal evacuation of these cases is contraindicated and that these should be treated as near the first-aid zone as practicable. Sauerbrück and Brockard, who discussed gunshot injuries of the chest at the Congress of German Surgeons held at Brussels last May, called attention to the serious nature of this class of wounds in the present war and they are decidedly of the opinion that lung wounds should be kept quiet two weeks or longer before transportation is permitted.)

In the discussion of sterile and septic hemothorax Bradford and Elliott bring out some very interesting data.

Sterile hemothorax. Post-mortem evidence taught them that the source of the effused blood cannot be definitely determined during life. They seldom saw cases of prolonged hemorrhage or late resumption of it. They believe that in cases that reach hospital care the hemorrhage takes place rapidly and then ceases.

The fact that a fluid resembling blood is at times removed by aspiration and fails to coagulate has elicited much discussion as to the extent to which the effused blood coagulates inside the pleural cavity. The authors consider it probable that clotting may be interfered with by the churning movements of respiration, so that the fibrin is whipped out in layers which cover the pleural surfaces while the serum retains much of the red corpuscles in suspension. Ordinarily they believe the clotting always takes place and very early through the action of the ferment liberated at the surface of the wounded tissues. The clot may be complete and massive, but with an early and fairly extensive separation of the yellow serum from the clot. In such a case as the latter, the fluid which separates from the clot is generally tinted by the products of hemolysis or it is a clear transparent yellow.

Large collections, together with blood causing complete collapse of the lung, are rare. There were but 3 cases of pneumothorax out of 318 cases and only 4 cases of pneumothorax without the presence of blood.

Clinical features. The physical chest signs are the same as those to be found with fluid in the pleura. Dyspnea is one of the early and distressing signs and it persists as long as there is a large effusion in the pleura. Without extensive effusion it disappears in about three days. The temperature rises to 101 to 104° F. However, it falls nearly to normal, oscillating between 90 and 100° F. in the next two weeks. A high level is rarely shown and unlike the oscillations in septic hemothorax it only ranges at most from 90 to 101° F. or 100 to 104° F., after which it drops to normal.

Treatment. The treatment of sterile hemothorax consists in removal by aspiration of the free fluid

when the fluid exceeds 20 to 30 ounces or when the dullness reaches half way up the scapula. Among 89 sterile effusions averaging 3 pints in volume aspirated, there was no evidence of later hemorrhage, and in but one instance was empyema known to develop later. Aspiration should be practiced from the seventh to the tenth day. A bacteriological examination of all fluids removed should be made at once. To control the dyspnea and fits of coughing which often supervene during the removal of the fluid by alternately aspirating the fluid and injecting oxygen it is possible to empty a chest of all fluid without causing pain.

Septic hemothorax. Primary infection is so frequent in this war that every hemothorax with fever must be suspected of sepsis. The pneumococcus, micrococcus tetragenus, and bacillus influenza, the denizens of the respiratory tract, were the offenders in about 30 per cent of the cases. The remainder had been infected from the skin, particles of clothing or part of the equipment carried in with the bullets, or by dirt which was either normally present on the projectiles when they were fired or such dirt as they acquired in ricochet. The offending organisms thus acquired were made up of two groups; namely, streptococci and staphylococci, and anaerobic gas-producing bacilli of fecal origin. The latter abided in 50 per cent of the cases in pure culture or mixed with cocci, and their presence is responsible for a very characteristic clinical picture. In 190 sterile cases of hemothorax there were 121 bullet and 55 shell wounds. In 77 cases which lived there were 33 bullet and 38 shell wounds; in 35 septic cases which died there were 14 bullet and 18 shell wounds. The authors insist that early transport does not increase the incidence of infection since the septic cases were known to become infected very early.

The following points which go far to suggest infection are noted among the clinical features:

1. Fever, developing progressively, or sustained at a steady high level, or with widely irregular excursions of temperature. A sterile hemothorax may be accompanied by fever lasting as long as three weeks, but the daily oscillations as a rule show regular uniformity.
2. A rapid pulse of 100, 120, or even higher, is customary, but severe infection may be present with a pulse of only 80 or 90.
3. Dyspnea, which is out of proportion to the physical signs and increases instead of diminishing.
4. A furred tongue which tends to be dry and brown with streptococcal infections. The anaerobic bacilli do not influence fur on the tongue.
5. Sleeplessness. Mild delirium marks a grave and usually hopeless infection.
6. The appearance of pain and tenderness in the side as the pleural inflammation develops. Pain caused by fractured ribs or by subcutaneous emphysema must be excluded.
7. Vomiting invariably means that abdominal organs as well as the lungs have been injured.

8. The physical signs of a septic hæmothorax do not differ from those of a sterile effusion, except in the cases where anaerobic bacilli are present. The signs are caused by the slow or rapid development of malodorous gases as the bacilli grow in the effused blood: (a) rapid displacement of the heart; (b) cracked-pot resonance over the bubble of gas in the area of dullness of the hæmothorax. The gas may develop rapidly, the patient may show great respiratory distress, and may collapse without high fever. These cases are liable to a disastrous error in diagnosis which regards them as an increasing pneumohæmothorax that can only be saved by rest and morphia.

The foregoing may raise the suspicion of infection. If a case fails to show improvement in the general condition, the suspicion is thereby increased, but the positive way to obtain evidence of infection is by the use of the exploring needle. The sample will show a heavy deposit of pus with offensive odor like that of rotten eggs or faeces pointing to gas-producing anaerobic bacilli. If organisms are not revealed in the first examination other samples should be examined later.

Treatment. Early recognition of infection is very important. Much harm results from delay in diagnosis and proper treatment; the patient's strength is reduced; more or less lasting injury to the chest from thickened inflamed pleura is produced; and fatal septicæmia may be induced.

Infected fluid may be removed by aspiration, but the entire removal of clot and pus is the only desirable resource and this is done by resecting a rib or two to insure thorough drainage.

Prognosis. Cases of anaerobic infections often make excellent recoveries. Grave symptoms are

of a mechanical nature rather than septic, owing to the rapid development of gas. The worst infections are the streptococcal cases which may produce a hopeless septicæmia. In one group, 28 recoveries occurred in men infected by gas bacilli, with 7 deaths; while 8 pure streptococcal cases lived, and 3 died.

The following interesting summary is laid down by the authors:

1. The total mortality of chest wounds reaching hospital care was 10 per cent.

2. Simple hæmorrhage never causes death after the third day. Sepsis is the principal cause of mortality from this time onward.

3. Primary infection occurs in 25 per cent of the effusions and it is fatal in one-third of the cases.

4. A sterile hæmothorax should be emptied by aspiration except when it is of small size.

5. Infection should be suspected in all cases which are not progressing favorably after the fourth day. It cannot be diagnosed with certainty on clinical features alone; a sample of the fluid withdrawn should be examined bacteriologically.

6. A hæmothorax fluid which looks red and innocent may nevertheless be heavily infected.

7. The chest should be opened as soon as possible in all cases of infected hæmothorax.

8. The signs of air as well as blood in the chest may be caused by foul gas evolved in the course of an infection by anaerobic bacilli. Immediate resection is then required.

A complete pneumothorax or a large pneumohæmothorax due to air leak from the lung is not often infected. If infection is present, an attempt should be made to expand the lung again by aspiration before rib resection is performed.

GYNECOLOGY

UTERUS

Wile, U. J., and Sencar, F. E.: **Chancere of the Cervix Uteri.** *Surg., Gynec. & Obst.*, 1915, 23, 643.

The authors discuss the relative infrequency of chancres of the cervix as compared with those seen on other parts of the female genitalia. The literature contains but scant and meager references to the subject.

The authors had the opportunity of studying carefully two cases of cervical chancere at the University Hospital in Ann Arbor. In one case the diagnosis of carcinoma of the cervix had been made, due to the extreme friability and excessive bleeding and to the gross appearance which closely resembles that of cervical cancer. In the other case the chancere appeared as a simple erosion.

Attention is called to the extreme difficulty of diagnosis, owing to the fact that the ordinary diagnostic criteria, by reason of anatomical factors, are not present in the primary syphilitic sore of the cervix.

In general the chancres of the cervix uteri occur in hypertrophic form, and as papulo-erosive lesions. In the two cases described the active spirocheta were demonstrable from the smears taken from the lesions.

From the standpoint of differential diagnosis, the chancroid, carcinoma, herpetic lesions, and simple cervical erosions come into consideration.

The absence of the satellite bubo in the groin makes the diagnosis more difficult. The authors believe that the pelvic lymph glands are probably involved as satellite buboes, but these are difficult of clinical demonstration. While a rare condition the authors believe that a considerable number of cases escape recognition due to neglect of careful examination.

Degrais, P.: **Radium Therapy of Cancer of the Cervix** (*Radiationthérapie du cancer du col de l'utérus*). *Ann. de gynéc. et d'obst.*, 1915, 21, 609.

It is only within recent years that the histological changes shown in cancer-cells after the application of radium and the clinical results in superficial cancers have encouraged physicians to extend the use of radium to deep-seated malignant growths. The uterus particularly should be given the advantage of radium treatment, for the histological characteristics of the mucous membrane of the cervix are such that it should react very much as the skin does. For some years Degrais has been using radium in these cases, and while the time is not long enough or the cases numerous enough to speak of cures, there is no doubt that much has been ac-

complished. Pain and hemorrhage are relieved, life made much more endurable and in many cases it is undoubtedly prolonged. It gives these good results in the very cases where surgery is helpless, that is, in the far advanced cases.

Where radium therapy is to be used, as much of the growth as possible should be removed surgically and then the radium treatment given with suitable filtration and by the cross-fire method, subjecting all parts of the tumor to the rays at once. The radium is applied in the rectum as well as the vagina, for it has been found that the rectovaginal septum is very frequently involved. The patients are instructed to return at stated intervals for examination and sometimes the radium treatment is given the second time if there are any signs of recurrence. The author has a number of patients who seem to be in good health now four years after treatment. Another benefit of radium treatment is that it sometimes reduces the cancer so as to make an inoperable case operable. A. Goss.

Kelly, H. A., and Burnam, C. F.: **Radium in the Treatment of Carcinomata of the Cervix Uteri and Vagina.** *J. Am. M. Ass.*, 1915, 10, 1574.

The authors' conclusions as to the action of radium is that to markedly varying degrees it injures all tissues and that the injury is some kind of intracellular chemical change. It seems improbable, however, that the disappearance of cancer-cells without any demonstrable effect on normal cells can be due solely to a difference in resistance of the cells to radiation. The common observation that in two cases with the same type of growth, subjected to the same radiation, different results are obtained; that in one the cancer disappears promptly and in the other is not affected at all, suggests the importance of resistance in the patient. It also opens up a wide field for speculation and experimental investigation as to what this resistance may be, where it is located, how it may be artificially produced, etc.

The most easily injured normal tissue in connection with cervical and vaginal cancer radiation is the rectum. In the authors' earlier cases, when they were less familiar with their agent and totally unacquainted with the tissue reactions, this complication was not uncommon and, in some cases, led to such serious results as ulceration, fistula formation, and even death from infection.

The results obtained by the treatments may be summarized as follows:

Of the 215 cases treated, 14 were operable and 199 inoperable.

Operable cases. Of the 14 operable cases, 10 patients were operated upon and treated prophylactically with radium. Of these, 2 have been well for more than three years, 1 for more than two years, 4 for more than a year, and 3 for more than six months. The number is too small to draw conclusions from and yet is suggestive when it is considered that in 75 per cent of all cases with operation there is recurrence and that 60 per cent of these recurrences take place within one year following operation.

In 4 cases of the operable group, on account of some general contra-indication to operation, radium alone was used. All of this group are living and well; 2 for more than three years and 2 for more than one year.

Inoperable cases. The total number of inoperable and inoperable recurrent cases is 109, of which 53 patients have been clinically cured, 109 markedly improved, and 37 not improved.

This series includes 35 cases of originally inoperable cancer of the cervix uteri or vagina in which the patients are clinically cured; in 3 cases for over four years; in 2 cases for over three years; in 4 cases for over two years; in 17 cases for over one year; in 10 cases for over six months. It also includes 18 cases of originally inoperable recurrent cancers in which the patients are now clinically cured; in 1 case for over six years; in 1 case for over four years; in 11 cases for over two years; in 10 cases for over one year; in 5 cases for over six months.

Excluding the operable cases, in which the authors have both operated and used radium, there are 203 cases left; in 57 of these cases the patients are clinically cured. The word "clinically" cured is used and the word "cured" reserved for later reports to apply to cases beyond the five-year limit, which has been conventionally adopted by surgeons as a time limit for estimating the permanency of cures of malignant disease.

Of the 57 clinical cures, 1 has lasted for six years; 3 for over four years; 4 for over three years; 5 for over two years; 29 for over one year; and 15 for over six months.

The following conclusions are reached:

1. That radium is of exceedingly great value in the treatment of cancers of the cervix uteri and vagina.

2. That the results in the next 200 cases will far surpass those reported here.

3. That the betterment in the improved but not cured cases is so marked that it alone makes radium a great addition to existing methods and would justify its use.

4. That every inoperable cancer of the cervix uteri or vagina, provided general metastasis is not evident, stands a chance of at least 1 in 4 of cure by radium treatment.

5. That there is marked reason to believe, not only that a large number of inoperable cases are curable, but that, by the joint use of radium and

operation, the 1 in 4 cure rate of operation in operable cases may be raised to 3 in 4 or better.

6. That some cervical cancers do not respond to radium treatment. This same variation in reaction occurs in many other types of neoplasm. It is apparently due to a lack in the patient of resistance to the specific growth. Work should be directed toward determining where the body products which attack a radiated cancer arise and what they are. On account of the certainty that some of the operable cancers of the cervix would not be cured by radium and also on account of the necessity of having many patients remain cured over five years in order to be sure of the permanency of the results, hysterectomy and radiation are advised in operable cases. This is the rule in clearly operable conditions. In borderline cases, the use of radium is advised, as the permanent cures from operation are not numerous in this group. If the growth does disappear, it can only be determined whether or not hysterectomy is advisable by trying out both methods; this as yet has not been done in a sufficient number of cases to arrive at any definite conclusions. However, when clinical cures have occurred in inoperable cases, operations are probably best not carried out. Manifestly, an inoperable case which becomes operable, but does not entirely heal, should be treated by operation.

EDWARD L. CORWELL.

Clark, S. M. D.: The Value of the Combination Method in the Treatment of Cervical Carcinoma. *J. Am. M. Ass.* 1913, LV, 1171.

The perfection of the Percy heat method marks a brilliant epoch in the cancer problem. Though possessing many admirable qualities, it does not seem, when viewed in the light of a cure, that it is a method to be singly used. It should be classed as a valuable adjunct and its chief virtues are demonstrated when combined with other equally valuable but operative methods.

For purposes of discussion, cervical carcinoma may be conveniently divided as follows:

1. The first group comprises the incipient cases, in which ulceration is strictly limited to the cervix. There is free mobility; no infiltration, but an occasional unaccountable show. The menses are slightly prolonged. Constitutionally the patients are unimpaired.

2. In this group the cervix is well infiltrated with carcinoma. The growth is just beginning to spread to the vaginal walls. The uterus is still movable, though there is a definite thickening in its lower and middle segment. There is no appreciable lateral infiltration, and no pain in the sides. There is copious bleeding and secondary anemia, and constitutionally the patient is below par. This is the type in which the radical operation is reluctantly considered from the standpoints both of primary mortality and of permanent cure.

3. In this group there is either a crater or a large cauliflower mass in the vault of the vagina. There is

metable lateral infiltration as well as involvement of the vaginal wall at least an inch from the cervix. There is a decided impairment of mobility. There is pain in the sides, marked cachexia and anemia. Constitutionally and locally these cases are surgically impossible from the radical standpoint.

4. The cases in this group are hopelessly advanced. There are conglomerate metastases of the rectum, bladder, and vagina. The inguinal lymphatics are involved, and there is a constant discharge with foul odor. The patients are constitutionally wrecked and are frequently opium habitués.

Cases falling in the first group are treated by combining at the one sitting the application of heat with the Wertheim removal. The abdomen is opened, thoroughly packed off and, as a prophylactic hemostatic measure, both internal iliacs are ligated, which excellently serves in reducing bleeding so frequently associated with the radical work.

In extremely obese women of small stature, it is a physical impossibility to operate radically; furthermore, if it were possible, the primary mortality would be so high as to render the procedure unwise. Here the liberal application of heat offers the best and only chance, as these patients are unfit for extensive operating and yet can well withstand the abdominal incision for the introduction of the guiding hand.

In the second group, the Percy method occupies a unique position in that it converts the constitutionally unfit into good surgical risks and, too, causes marked shrinkage in the local area. By employing it in combination with ligation of both internal iliacs and one ovary at the first sitting, with a three and a half weeks' interval, these surgically doubtful risks are literally transformed into safely operable cases.

The plan adopted is to cook and ligate and then let the patient remain in bed about ten days, at which time the slough detaches. The hemorrhage and toxemia having been controlled, the patient is permitted to return home and daily douches and fomenting initiated.

By the use of the two-stage plan, such cases can be radically improved and it can be positively asserted that it is a method which increases the operability of cervical cancer as well as reduces its primary mortality.

The third group of cases has heretofore been considered hopeless. The patients would, as a rule, be superficially soothed and sent home to die. Since employing the elaborate heat plan as a routine in combination with internal iliac and one ovarian ligation, the author feels that, though permanent relief is not, as a rule, to be expected, much genuine comfort and some cures can be given this group.

The author has had two cases which, when first seen, were obviously inoperable, but, after the use of the combination method, they changed so completely that the Wertheim operation was performed. Even after very careful search, no cancer-cells could be found in either of these specimens.

The fourth group is the absolutely hopeless class. It is to be hoped, however, that, as a result of improved medical education, combined with the educational work now being so splendidly conducted by the cancer commission, this group will greatly diminish.

EDWARD L. CORWELL.

Shlenker, M. A.: Cervical Myoma; Report of an Unusual Case. *N. Orl. M. & S. J.*, 1915, lxxiv, 324.

The case is reported of a woman, aged 53 years, who had been married 14 years. Her menses began at 13 years; were of the regular 28-day type, duration 7 days or more, amount always more or less profuse. During the last 3 months her periods were irregular and painful lasting much longer than usual. The last period persisted throughout the entire month, during which time she passed many large clots. She had had three full-term children and two miscarriages, both of the latter occurring more than three years previous.

Three days before admission to the hospital very severe pains set in which the midwife diagnosed as labor pains. These pains continued for several days until a mass was noticed protruding from the vagina, when she was sent to the hospital. On admission to the hospital a diagnosis of inversion of the uterus was made. A great deal of blood had been lost and the patient was in a state of shock. On inspection the protruding mass was found to be not unlike an inverted uterus, but closer examination proved it to be a cervical myoma which had ruptured spontaneously from the left side of the cervical wall. The mass was removed and the patient made an uneventful recovery.

The specimen consisted of a soft pliant mass 9.5 x 11 x 5.5 cm. The surface was irregular in outline and at two points was distinctly lobulated. There was a connective-tissue capsular layer over most of the tumor. Microscopically, it was a typical leiomyoma with varying amounts of muscle, connective tissue, vessels, and hyaline degeneration.

The diagnosis was fibro-leiomyoma (fibroid).

C. D. HOLMES.

Schmitz, H.: The Action of Radium on Cancers of the Pelvic Organs; a Clinical and Histologic Study. *J. Am. M. Ass.*, 1915, lxx, 1879.

Since April, 1914, the author has treated 112 cases of malignant growths of various regions of the body with radium. Forty-eight of these occurred in pelvic organs. Forty-one of these pelvic cancers are considered in this paper; 16 were in the uterus, 5 in the rectum and 3 in the bladder. The tumors were inoperable, recurrent, or operable carcinomata; 14 were inoperable, 6 recurrent, and 8 operable.

Ten of the inoperable and three of the recurrent carcinomata were thoroughly cauterized or excochleated and then cauterized preceding the application of radium. Broken-down tissue and debris were thereby as completely removed as

possible, and the extent of the intensity of the X-rays into the depths of the tissues correspondingly increased. The operable cases were subjected to an extensive vaginal cauterization and an abdominal panhysterectomy. As soon as the patient recovered from the operation, radium was inserted into the crater of the broad ligament. The rays were used as a prophylactic to recurrence.

The following plan of treatment was adopted and carried out in the last cases:

A course consists of from six to eight sances of from ten to twelve hours each, with an interval of from thirty-six to sixty hours. This course is followed by an intermission of three weeks. If a bimanual examination made at this time reveals an apparent cure, two or three applications of from 500 to 600 mg. hours of radium element are given every second or third day. Another interval of three weeks is allowed to elapse, and if the examination then reveals a normal condition the treatment is considered terminated. Negative findings, of course, are followed by another course of from 3,000 to 4,000 mg. hours.

This "interval method" gave the best subjective and objective results with a minimum of concomitant symptoms.

Brass filters of from 1 to 1.5 mm. thickness were used. Whether or not lead filters cause severer latent destruction of tissue than brass filters, the author was unable to prove. Such disturbances occurred either in very advanced cases of carcinoma, with breaking down of uterine or vaginal walls, or in extensively cauterized tumors. The secondary rays produced in the metal filters were arrested by surrounding the filter with a cot made of pure Para rubber of a thickness of from 1 to 3 mm. The healthy vaginal walls were protected by snugly packing the vaginal canal with gauze, Para rubber, or lead plates surrounded by rubber and gauze.

The conclusions are as follows:

1. The best method of applying radium is the interval method by which from 3,000 to 4,000 mg. hours of radium element are applied within from about fourteen to twenty-one days.

2. The α and β rays must be arrested by a brass filter of from 1 to 1.5 mm. thickness.

3. The secondary rays, forming in the metal filter, are rendered inert by a rubber cot of from 1 to 3 mm. thickness.

4. Inoperable cancers that are not far advanced so that cauterization is not contra-indicated yield satisfactorily to radium therapy.

5. Advanced inoperable and recurrent cancers are ordinarily refractory toward the radium rays. Any improvement is at least very temporary.

6. Patients treated with the rays after surgical removal of the organs have done well, although the time since the treatment averages only about eight months.

7. Patients suffering from cancer should be treated surgically and then radiologically, and if

surgery is contra-indicated they should receive radium treatment, which at least relieves the subjective symptoms and often the objective ones.

8. The time elapsed since the commencement of the radium treatment in all the cases enumerated is too short to permit a definite opinion to be formed as to the remote results of radium treatment.

9. Clinical and histologic studies enable us to pronounce the radium rays a valuable addition to the therapy of cancer.

10. It will require years of constant observation to demonstrate such results as anatomic cures.

11. The same measure that is applied to establish the efficacy of surgical procedures in cancer treatment must certainly be employed in radiotherapy.

EDWARD L. CORNELL.

Fabre: The Indications of Radium Therapy in the Treatment of Cancer of the Uterus (*Les indications de la radiumthérapie dans le traitement du cancer de l'utérus*). *Ann. de gynec. et d'obst.*, 1915, XI, 620.

Fabre gives the detailed histories of ten cases of uterine cancer in which she has used radium with excellent results. There are only about 25 per cent of the cancer cases that present themselves to the surgeon in a stage which offers any hope of successful operation. Radium is extremely useful in this very large class of inoperable cases. All inoperable and recurrent cases should be treated exclusively with radium. In cancers on the borderline of operability radium should be given as a preparatory treatment. It often reduces the growth so that it can be operated upon. Operable cancers should be operated upon, but radium should be given after the operation, as it completes the surgical procedure and is of great value in preventing recurrence.

A. Goss.

Olow, J.: Coexistence of Myoma and Malignant Tumor and Its Significance in the Treatment of Myoma (*Sur la présence simultanée de myomes et de tumeurs malignes et de l'importance de cette coexistence sur la question du traitement des myomes*). *Arch. mens. d'obst. et de gynec.*, 1915, IV, 369.

The author has had microscopic examination made of the cases of myoma at the gynecological clinic of the University of Lund, and has found that 5.2 per cent were complicated by malignant tumors. This finding is of considerable importance in considering the radiotherapy of myoma. There is danger of overlooking a malignant growth which will have further time for development while the radiotherapy is being given. He concludes that when radium treatment is given for myoma if there is not very prompt improvement, or if there is a recrudescence after an initial improvement, the conservative treatment should be given up and radical operation performed.

Radium has a particularly good effect on hemorrhage and if this is not promptly controlled it is

almost certain that malignant disease coexists. Clow therefore advises total extirpation, not only when a diagnosis of malignant tumor has been made, but in all cases of myoma where it is not contraindicated, for the sake of avoiding the possibility of malignancy. The ovaries should be removed at the same time, especially in women who are nearing the menopause.

A. Goss.

Tuttle, E. G.: Surgical Treatment of Anterior Displacements of the Uterus Accompanied by Irritation of the Bladder, Dysmenorrhea, and Sterility. *N. Am. J. Homoeop.*, 1915, XXX, 487.

Tuttle states that the literature pertaining to the treatment of anterior displacements of the uterus is very meager as compared to that regarding posterior displacements. Posterior displacements are more common and are usually accompanied by a train of symptoms far more severe than anterior displacements, hence the multiplicity of methods for treatment in the former as compared with the latter.

Irritation of the bladder, dysmenorrhea, and later sterility are the most important symptoms resulting from anterior displacements of the uterus. Endometritis, stenosis of the internal os, stricture and elongated cervix are also often associated lesions.

The treatment of pathological anterior displacements is surgical. The size and position of the uterus, i.e., the degree of displacement, together with the length, size, and position of the cervix, will, in each case, determine the method of procedure. Careful and persistent after-treatment is essential to the successful cure of these conditions.

HARVEY B. MATTHEWS.

O'Connor, J.: A Mode for Ventrofixation of the Uterus for the Relief of Prolapsus. *Ann. Surg. Phila.*, 1915, LVII, 479.

In the author's opinion the dominant factor in uterine prolapse is the relaxation of the cervical attachments, and any operation designed for the relief of prolapse should, therefore, aim at fixation of the cervix. In the author's operation the cervix is fixed to the recti muscles in the following manner:

The abdomen is opened by a low central incision and the uterus exposed. A small transverse incision is made through the uterine peritoneum, just above and parallel to the uterovesical peritoneal reflection. The uterine peritoneum, with the bladder, is reflected downward and forward until a space one inch square is denuded on the anterior surface of the cervix. Next, three 11-day catgut sutures are passed, one-third of an inch apart, through this exposed portion of the cervix and deep enough to catch a firm grip of the cervical muscular coat. The ends of these sutures are drawn out on each side respectively, through the recti muscles by a Child ligature forceps. Thus the peritoneum is excluded and the denuded surface of the cervix is brought into direct apposition with the recti. To avoid subse-

quent intestinal adhesions at the site of fixation, the parietal wound is closed by tier sutures, the first suture purposely including the uterine peritoneum well above the denuded area. Cystohysterectomy, in addition, may be done when necessary.

As the first step in any operation for prolapse of the uterus, dilatation and curettage, trachelorrhaphy or amputation of the cervix with anterior and posterior colporrhaphy, one or both, should be done whenever necessary. HARVEY B. MATTHEWS.

ADNEXAL AND PERIUTERINE CONDITIONS

Hellman, A. M.: Fibroid of Ligamentum Ovarii Proprium. *N. Y. M. J.*, 1915, VII, 944.

The case is reported of a woman, age 44, whose menses began at 13 years, regular 5-day type, duration 3 days. She had borne 6 children and had 5 abortions. During March, 1912, she had a severe cold and sudden difficulty of urination. This same urinary symptom recurred on June 1 and again on June 30. In the last mentioned attack she was catheterized for two days, and sent to the hospital. On examination a large adnexal tumor was found and a panhysterectomy performed July 6, 1912.

The tumor was 14x16 cm., had a circumference of 36 cm., and was attached to the ligamentum ovarii proprium. It was hard and smooth externally, and on cross-section it was found to be hard, smooth, shiny, and without cysts. The ovaries were normal. Microscopically the tumor tissue was rich in cells, with nuclei oval or rounded, close together, and separated only by a few, sharply defined, thicker, red-stained connective-tissue bundles. Throughout the tumor the nuclei were regular in form and in the intensity with which they took the stain. Here and there were larger and smaller vessels, in part surrounded by hyaline degeneration. The Giemsa stain showed some yellow areas which were undoubtedly blood. Sections from the edges of the tumor showed cell groups separated from one another by edema. The ovaries showed large corpora fibrosa and subepithelial cysts.

The diagnosis was fibroid tumor very rich in cells and arising from the ligamentum ovarii proprium.

C. D. HARRIS.

Goldberg, S.: Operative Conservation of the Ovary. *Buff. M. J.*, 1915, LVII, 113.

The ovary, being an organ of such vital importance to the female economy, its operative conservation should ever be uppermost in the mind of the surgeon, first, because of its threefold function: the causing of menstruation, the secreting of ova and hormones; second, because there is no condition, mechanical or pathological, except in extremely rare cases, in which the ovary is so thoroughly incapacitated from its normal functioning but that some part of it may be conserved in the interests of the patient; third, the percentage of recurrences after conservative operation will be greatly reduced when straight horizontal incision is used instead of

the more generally used elliptical fourth, removal of ovaries does not produce deleterious effects because there is no longer a secretion of the ovarian hormone *per se* but because its absence destroys that normal hormone cycle of all ductless glands.

C. D. HOLMES.

Figueiredo, J. P. de: Is Partial Resection of Sclerotic Ovaries Justified (La résection partielle des ovaires reconnues macroscopiquement scléreux ou scléro-kystiques est-elle justifiée au point de vue microscopique?) *Ann. de gynec. et d'obst.*, 1915, xli, 595, 610, 694.

The author bases his paper on a microscopic examination of 61 ovaries from 50 patients with a view to determining whether the microscopic appearance of sclerotic or sclerocystic ovaries is such as to justify their resection. He found that the vitality of the primordial follicles is generally affected. In some cases a few of the follicles may develop normally and give rise to pregnancy. The number of follicles is generally in inverse ratio to the degree of sclerosis. There were lesions of the stroma in all except one of the cases. The arteries show thickening of the walls and hyaline degeneration regardless of the age of the patient.

Various kinds of abnormal formations were found in the ovaries examined, including: (1) epithelial formations, such as remnants of the wolffian body and inclusions of germinal epithelium; (2) primordial follicles already degenerated or in process of degeneration; (3) graafian follicles undergoing cystic or hyaline degeneration; (4) islands of interstitial cells; (5) cysts of the corpus luteum; (6) fibrous adhesions; and (7) old or recent hemorrhagic foci. As the greater part of these formations are capable of proliferating and producing the most serious pathological phenomena the author concludes that resection is indicated, more especially as it is practically without danger.

A. Goss.

Chalfant, S. A.: Subcutaneous Transplantation of Ovarian Tissue; Report of Thirty-two Cases with Special Reference to the Effect of Such Transplantation on the Menopause. *Surg. Gynec. & Obst.*, 1915, xli, 579.

This procedure was first employed by F. F. Simpson in 1912, in an effort to prevent, or to lessen the severity of, the menopausal symptoms in a young girl in whom it was necessary to remove both tubes and ovaries for extensive inflammatory disease.

The literature is reviewed from Martin's paper in 1911 and 32 cases of transplantation reported. In these cases sections of one or both ovaries were used. These sections were placed in the subcutaneous tissue of the abdominal wall through a separate incision. This site was selected because it was not thought wise to leave tissue, which was in many cases probably infected, in the peritoneal cavity; and if trouble did occur the graft could be removed without the necessity of a second laparotomy.

In 9 of 13 cases in which one ovary remained in the pelvis the graft was palpable at the time of examination; in one, more than a year after operation; and in two, variations in size were detected by the patient.

Of 2 cases where the uterus was left but both ovaries removed, one patient menstruated after three months and regularly thereafter to the present time except for one month.

Of the 17 patients in which the uterus and both ovaries were removed, 15 were traced. In 12 the graft was palpable and 5 gave evidence of continued function as shown by variations in size and increased tenderness.

Among the 17 cases, including the two in whom the uterus was left, 2 had no disturbance of the menopause, 7 had only slight menopausal symptoms, 5 moderate and 3 severe. In 40 cases without transplantation the menopausal symptoms were more severe.

The author's conclusions are:

1. Subcutaneous transplantation of ovarian tissue does not increase the risk of operation.
2. In the majority of patients the graft will persist for a time. In this series it is still present at twenty-seven months, sixteen months, and in 3 cases more than a year.
3. In some patients it appears to functionate, as shown by the apparent development of graafian follicles, by variations in size and tenderness, and, when the uterus remains, by menstruation.
4. The presence of one ovary in the pelvis does not necessarily interfere with the success of the graft.
5. Those patients in whom ovarian tissue has been grafted seem to have less discomfort from the premature menopause.

Mitchell, L. A.: Influence of Peptone on Tolerance of the Body for Homogenous Ovarian Transplants. *J. Am. M. Ass.*, 1915, lxx, 1692.

Peptone injections were made at the time of operation and thereafter every four days until the animal was sacrificed for necropsy. The injections were made intraperitoneally under aseptic precautions and the dose used was approximately 1 ccm. of a boiled 10 per cent solution of Witte's peptone to each 100 gm. of the rabbit's weight.

Following the peptone injections, the animals showed a reaction which was manifested by labored breathing, restlessness, and general bodily weakness. In every case after the animals had received from three to four injections, they showed a condition of reduced metabolism evidenced by a loss of body weight and marked thinning of the coat. This was not noticed in the controls, which were otherwise subject to similar conditions.

As a result of the experiments, the following conclusions may be reached:

1. Peptone injections tend to intensify rather than to inhibit the reaction of the host against homogenous grafts of ovarian tissue.

2. Such injections of peptone produce a condition of reduced metabolism in the animal, but not to such an extent as to prove dangerous to life.

3. An abundant blood supply to the graft does not indicate that it is viable in its new environment, but may rather be evidence of an intense reaction against it on the part of the host.

4. The destruction of the graft is practically complete by the sixth week, both in animals injected with peptone and in those not injected.

5. The host primarily reacts to the presence of the graft by revascularization of its tissues, and the further reaction which evidently involves the destruction of the graft is evidenced by round-cell infiltration and proliferation of the connective tissue of the host.

6. The presence of peritonitis within a few days destroys the viability of intraperitoneal grafts.

EDWARD L. CORNELL.

EXTERNAL GENITALIA

McKinnon, A. J.: The Advantages of Vaginal Section in Pelvic Surgery. *West M. Times*, 1915, JULY, 201.

In pelvic abscesses, pus tubes, pelvic lymphangitis, etc., colpotomy seems to be an ideal method of procedure. The freedom from pain and the rapidity of convalescence is in striking contrast to that following abdominal section for these conditions. The anterior vaginal method of treating prolapse and other displacements of the uterus, tumors of the uterus, and diseases of the tubes and ovaries, etc., offers some distinct advantages over other methods of treatment. The advantages are set forth by the author as follows:

1. In suspected tubal pregnancy a vaginal section is the simplest way of making a diagnosis, and if it is present it can be treated as well as through abdominal section.

2. Conservative work on tubes and ovaries is easier to perform through the vagina.

3. Convalescence is practically free from pain and more speedy.

4. The cosmetic feature is in its favor.

5. No visible scar or weakened abdominal wall remains.

The operation is briefly described in six stages:

1. Pull the cervix down with a tenaculum.

2. Make a transverse incision on the front of the cervix through the anterior vaginal fornix. With a blunt dissector separate the bladder from the vagina and make a vertical incision through the vagina to give more room if needed.

3. With gauze on the finger separate the bladder from the uterus.

4. Introduce a large retractor, lifting the bladder up behind the symphysis.

5. Incise the peritoneum.

6. Hook the finger over the fundus (or use a tenaculum), and push the cervix back and dislocate the fundus of the uterus into the vagina.

The tubes and ovaries drop into view on the back of the uterus.

Through this incision any operation can be done on the tubes or ovaries, the round ligaments treated, and tumors of the uterus excised. After completing the work, push the fundus back into the pelvis, stitch up the peritoneum and the incision in the vagina. Practically any operation in the pelvis can be performed through the incision described, and it almost entirely obliterates the distressing sequelae of abdominal section. C. D. HOWARD.

Ward, W. D.: The Construction of an Artificial Vagina with Establishment of the Menstrual Function. *Surg., Gynec. & Obst.*, 1915, xvi, 675.

The author describes the construction of an artificial vagina after the Baldwin method. The patient was a girl 13 years old just beginning to show signs of attempted menstruation. A normal functioning uterus was found, and Ward succeeded in connecting it with the vulva so that a regular menstrual function was established, as well as a good vagina constructed. A careful dissection was made between the bladder and rectum, and at a depth of about three inches from the incision of the mucous membrane the cervix was reached. It was grasped with a double tenaculum and pulled down, the connective tissue around it being peeled back, until finally the mouth of the cervix was exposed; a dilator passed into it revealed about an ounce of black tarry blood in the uterus. This was evacuated, and the cavity of the uterus, which was a little longer than normal, was wiped out with gauze. It was then packed with iodoform gauze, as was the cavity for the new vagina.

Six days later the abdomen was opened. The cæcum was located and a loop of small intestine twelve inches long just proximal to it was selected, which when doubled reached well down through the pelvis to the vulva. The loop was isolated by rubber-covered clamps and separated from the rest of the intestine, but was left attached to its own mesentery. The distal end of the isolated loop was closed by a purse-string suture of silk, and a half of a Murphy button was dropped into the short end of the ileum attached to the cæcum; the other end of the loop was cleaned but not closed, and the other half of the Murphy button was introduced into the proximal end of the ileum. The isolated loop was freed by making radiating incisions into the mesentery at each end to a depth of about three inches, which allowed the loop to be pulled into the pelvis without cutting off its blood supply. Putting together the two halves of the Murphy button restored the continuity of the small intestine, and the cut edges of mesentery were sutured together, closing the gap in the mesentery and covering over the raw edges. The peritoneum into the cavity made at the first operation was then opened, and with a forceps the doubled loop of intestine was drawn down to the vulva, the open end being stitched around the cervix. This finished the ab-

dominal work. The loop of the intestine at the vulva was then opened and the edges stitched there, both limbs of the intestinal loop being packed with iodoform gauze.

The patient's convalescence was uneventful and she went home before the end of the third week and in another two weeks was up and about.

MISCELLANEOUS

Fellenberg, R. von: Treatment of Sterility (*Ueber die Behandlung der weiblichen Unfruchtbarkeit*). *Cor. Bl. f. Schweiz. Aerzte*, 1915, xlv, 1409.

Sterility may be due to various causes, including gonorrhea, malposition of the uterus, vaginismus, etc., but there is no doubt it is due in a considerable number of cases to defective internal secretions. Sometimes it is due to an excess, rather than to a deficit of ovarian secretion.

The author describes the case of a woman, sterile for four years, from whom the whole of the left and a part of the right ovary were removed, after which she became pregnant. If one ovary is diseased it sometimes has an inhibitory effect on the other normal ovary, and after the diseased one is removed pregnancy occurs in the normal ovary.

The work of Kocher and others on the thyroid and hypophysis have shown that the genital function is influenced by a number of the glands of internal secretion. Guggisberg has shown that both the pregnant and non-pregnant uterus of mammals may be made to contract by the administration of extracts of such glands. The interstitial gland of the ovary seems to be responsible for the female secondary sexual characters, and a defect in its function causes infantilism of the genital organs, which is generally associated with chlorosis.

Kottmann has shown that defective ovarian function may cause defective assimilation of iron. Von Noorden has shown that the ovarian secretion influences the blood-forming organs; therefore ovarian treatment is justified in cases of infantilism associated with anæmia.

Bab in 1909 first suggested ovarian treatment for sterility due to defective ovarian function. He advises adding lecithin to the ovarian preparation to supply the need of the fœtus for lecithin. He holds that the ovarian extract has a threefold effect: (1) a local action on the ovary that corrects menstrual disturbances; (2) a local effect on the growth of the uterus and tubes, so that the hypoplastic condition is improved; and (3) a stimulating effect on the general health. Von Fellenberg has used ovarian treatment in a number of cases with excellent results. He combines with it measures to increase the blood supply of the genital organs, such as hot douches, sitz baths, and spa treatment.

Sterility may also be caused by defective thyroid

function. In these cases there is abnormally rapid coagulation of the blood, relatively low neutrophile and relatively high lymphocyte count, nervous irritability, spastic constipation, and migraine. Kocher believes that anæmia too is often due to defective thyroid function. Sehrt even says that an infantile uterus always indicates defective thyroid function. Conception may occur in such cases but it is followed almost immediately by abortion. The author has given thyroid treatment successfully in a number of such cases, pregnancy occurring in a number of women who had previously been sterile. There was also an improvement in the general health, and the spastic constipation disappeared. The blood should be examined at least once in two weeks. Under thyroid treatment in these cases it returns to normal. Hallion and Dellile gave ovarian extract and found a dilatation of the thyroid vessels and a fall of pressure in them. Gross and Tandler found at autopsy of castrated individuals that the thyroid was unusually small. Weil and Sehrt both observed pregnancy after the administration of iodothyroid to previously sterile women. So there is considerable evidence of the reciprocal action of the thyroid and genital organs.

A. Gross.

Wetherill, H. G.: The Relation of Pelvic to Abdominal Surgery. *Am. J. Obst.*, N. Y., 1915, lxxii, 615.

In concluding his discussion the author gives the following summary:

1. Incomplete abdominal and pelvic surgery is inevitable if an imaginary line is drawn at the pelvic brim beyond which the gynecologist and the general surgeon shall not go.

2. The best interests of the patient, the general surgeon, and the gynecologist will be served by the adoption of a broad and comprehensive policy in dealing with intra-abdominal diseases so that all of the pathologic conditions of the pelvic and abdominal organs may be discovered and dealt with at once when any abdominal operation is undertaken.

3. Such ends will be promoted by grouping the scientific workers in this abdominopelvic field in our medical societies and medical schools so that the study of, and teaching about, these allied and often interdependent diseases may be properly systematized and classified.

4. The experience of the last few years in the Section of Obstetrics, Gynecology, and Abdominal Surgery of the American Medical Association has been so eminently successful in bringing together those who are especially interested in abdominal surgery that it would appear to be wise for other similarly constituted societies to take the same broad view of the subject and make a like logical arrangement for the scientific work of such societies.

C. H. Davis.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Werner, P.: *Modern Treatment of Eclampsia* (Ueber moderne Eklampsitherapie). *Therap. Monatsh.*, 1915, xix, 389.

It is generally agreed that eclampsia is an intoxication, but the source of the toxin is still unknown. It has been attributed by some to the placenta and by others to toxins from the fetal serum. Neither theory explains all cases of eclampsia, for it has occurred in cases of hydatidiform mole without pregnancy, and after the delivery of fetus and placenta, and there are also cases that recover during pregnancy, when toxins from the fetus or placenta would still be active. If either of these theories is held as to the cause, the rational treatment of eclampsia is to empty the uterus at once. This was formerly done at the Vienna clinic by vaginal caesarean section, but this radical treatment has been abandoned, and now the chief reliance is placed on bleeding and narcotics. The patient is immediately placed in a dark, quiet room; the obstetric examination is made under slight general anesthesia and the urine is catheterized for examination. From 400 to 600 ccm. of blood are withdrawn, and an injection of 0.02 gm. morphine given at once, and three hours later an enema containing 3 gm. chloral hydrate. If the fetus is in good position for delivery it is delivered by forceps or extraction to save the patient the added irritation of labor pains. If the convulsions do not stop, the bleeding is repeated and more morphine and chloral is given. If eclampsia begins during pregnancy labor is induced by a bougie or a bag.

Werner has never decapsulated the kidney. In a series of 120 cases up to 1913 he had a maternal mortality of 15.8 per cent and an infantile mortality of 44.3 per cent. In the 38 cases he has had since then the maternal mortality was only 3.2 per cent and the mortality of the infants was 14.63 per cent. A. Göss.

Brown, W. M.: *Improvements in Technique of Caesarean Section*. *N. Y. St. J. Med.*, 1915, 19, 494.

The author reviews the early history of the operation, gives his own technique, presents four cases in which this technique was used successfully, and gives a résumé of 48 cases of caesarean section which were performed under his supervision.

While the early history of this operation is interesting because of its antiquity, it having been done prior to 715 B.C. It was used only as a post-mortem attempt to save the life of the child when the mother had died at or near term.

Its use as a means or attempt to save the mother dates from about the beginning of the sixteenth century, but until within a comparatively few years it was employed only as a forlorn hope and, of course, it was accompanied with a prohibitive mortality, yet it was an accepted procedure in hopeless cases and, after several centuries, Kayser found, in 1844, that the mortality rate was 62 per cent, while Larnier said that up to that time there had not been a single successful case in Paris during the nineteenth century and Späth said the same of Vienna.

In 1876 Porro proposed to do a supravaginal hysterectomy to avoid the dangers of infection and hemorrhage and his results were so good that for a time his operation replaced the more classical caesarean section, but in 1882 Saenger carefully sutured the uterine cut with 8 to 10 silver wire sutures which did not go through the decidua surface, and it seems to the author that the rules he laid down, of extreme antisepsis and careful suturing of the uterine wound, amount almost to a basic patent on which all of our success at the present time is founded.

From the time of Saenger's operation until Davis described his modification, the operation was always done with a long incision and turning out of the uterus from the abdominal cavity before it was opened and the child delivered. It was then thought that the thing of prime importance was to prevent the escape of the uterine contents into the peritoneal cavity and Davis thought that this could be equally well prevented with a short incision located high on the abdominal wall if absorbent pads were used and the uterus held up against the incision. He proposed to put in some heavy sutures at the upper and lower angles of the uterine wound and left the ends long to hold the uterus against the abdominal cut while it was being sutured.

The author proposes that the operation shall be done in the usual manner, as described by Davis, until the uterine cavity is opened; that then and before the child is delivered the edge of the uterine cut be fastened to the abdominal cut by from eight to ten temporary sutures which will pass entirely through the uterine muscle and the abdominal wall. These sutures may be of any material that the operator prefers, but the author thinks that a medium-sized silk can be used with the greatest facility.

The placing of these sutures will occupy about one and one-half minutes and when they are in place the operator is free to disregard the uterus and its relation to the abdominal cavity until such time as he has begun or partly completed the closure of the uterine cut. Brown believes that the careful development of this technique will not increase

the time of the ordinary operation, as the time lost in placing the sutures will generally be saved in the further steps when the operator is not bothered with the intestines getting in his way and he does not have to spend precious time in wiping blood-clots and meconium out of the peritoneal cavity. The author has used the method successfully in 4 cases.

In reviewing a series of 40 cases of cesarean section which came under his care or supervision, the author found a total mortality of 10 per cent. This series includes cases of primary and late operation, of eclampsia, toxemia, placenta prævia, tuberculosis, and heart-disease, as well as contracted pelvis, many of the cases combining more than one element of indication. Of the cases, 22 were operated on while in active labor dating from six hours to several days, or else were depleted by ante-partum bleeding, and practically every one had been examined by midwives or physicians at their homes, and a number had had attempts at forceps delivery.

Of the 22 cases operated on under such conditions but one died, making a death-rate of less than 5 per cent, and but one child was lost.

There were two Porro operations: one primary in a case of large carcinoma of the cervix, where a subsequent operation removed the growth and the woman is still living, now two and one-half years. The other was in a case which had been between five and six days in labor and was badly infected. This child was dead and macerated, but a true conjugate of 5 cm. made the operation one of obligation.

RALPH H. KUHN.

Reed, R. J.: Extraperitoneal Cesarean Section.
W. Virg. M. J., 1915, x, 121.

The statistics of some fifteen clinicians who have given special attention to the subject of cesarean section and have recorded their findings compel the conclusion that the classical or intraperitoneal operation is contra-indicated in cases clearly infected; that it cannot be undertaken with justice to the mother if a single unclean examination has been made, or if there have been repeated examinations through ruptured membranes, though made with a measure of care, or if there have been prolonged efforts at delivery.

The advantages most clear and outstanding of the extraperitoneal operation are: (1) the greatly reduced hazard with respect to post-operative sepsis; (2) less loss of blood in section through the lower uterine segment; (3) more rapid convalescence of the patient; (4) escape from danger of post-operative intra-abdominal adhesions.

There are two distinct methods of performing the section. One is by the true extraperitoneal technique; the other is designated as the transperitoneal method, but is made extraperitoneal in fact by first uniting the parietal and uterine peritoneal layers by a special technique before section is made of the uterine wall.

The anatomical facts upon which the operation by either method are dependent are: (1) "the

distention of the lower uterine segment; (2) the migration of the peritoneum during pregnancy, whereby the bladder is more or less deprived of peritoneum, and becomes in late labor uncovered by the peritoneum above and in front; (3) the growth of peritoneum due to the hypertrophy of pregnancy; (4) the loosening of the peritoneal reflection over the lower uterine segment, which enables it to be separated from the uterine wall with the greatest ease" (Nicholson).

The important points in the technique of the true extraperitoneal operation are: (1) an extreme Trendelenburg position for the patient; (2) a central vertical incision of the abdominal wall to the peritoneum, from the symphysis to a point two inches below the umbilicus; (3) the separation of the recti muscles and of the subperitoneal tissue from the under surface of the recti; (4) freeing the peritoneum from the top of the bladder by careful blunt dissection with gloved finger and gauze sponge; (5) the upward displacement of the unopened sack of the peritoneum with a coincident downward displacement of the bladder below the symphysis. Additional space is obtained by carrying on the work of separation laterally, the selection of the side to be freed depending upon the presentation of the child. If in the left position, the dissection is carried to the left, and if in the right position, to the right; (6) the vertical section of the uterine wall; (7) the delivery of the child by forceps, the concavity of the blades being turned toward the symphysis, and the bladder protected by gauze during the time the forceps are in use; (8) the management of the placenta and the establishment of cervical drainage, the same as in the classical operation; (9) the uterine incision is closed by interrupted sutures and a small gauze drain placed in the subserous space, the abdominal wall being closed in the usual way.

The true extraperitoneal operation is the one found in favor in both Vienna and Berlin. It is the ideal method in being what it claims to be; it is rapidly and safely executed; and it guarantees the surest protection against abdominal infection.

In the modified or transperitoneal operation the patient is placed in a moderate instead of an extreme Trendelenburg position; (2) the abdominal incision is the same in length as by the other method, central and vertical; the peritoneal layer is incised in its lower two or three inches, beginning with the top of the bladder and extending to a point opposite which the uterine peritoneum is seen to be firmly attached; (3) the uterine peritoneum is then incised to a like extent of two or three inches from the top of the bladder to a point on the uterus where the peritoneum becomes firmly attached; (4) these peritoneal edges, parietal and uterine, are freed by blunt dissection for an inch or more, then united by catgut sutures. (5) through this oval opening, the abdominal cavity having been shut off, the uterus is opened and the delivery of the child effected by forceps; (6) management of the placenta and drainage of the same as in other methods; (7) the uterine

wall is closed by interrupted sutures and by a continuous suture the united folds of the peritoneum are closed over it. Some operators prefer to separate the sutured peritoneal folds after the uterine sutures have been placed and close as in the "classical operation."

The advocates of the transperitoneal operation maintain that it is performed (1) with less difficulty than is the true extraperitoneal; (2) that it affords equal protection against intra-abdominal sepsis; (3) that there is less danger of bladder trauma; and (4) the possibility of cellulitis is escaped, which may occur by the other method, due to the extensive dissection through the subserous tissues.

Montgomery, E. E.: Abortion; Its Causes and Treatment. *J. Am. M. Ass.*, 1915, lxx, 1262.

When it becomes evident that abortion will occur in spite of measures to avoid it, the early aseptic evacuation of the uterus is advisable. The natural inclination of the physician, when consulted by a patient who has undergone a recent abortion, is to make sure that the embryonic products have been completely evacuated, particularly if there are present symptoms of infection as indicated by elevation of temperature, rapid pulse, tenderness over the abdomen, and pain in the pelvis. The friends of the patient attribute such phenomena to retention of portions of the products of gestation and are insistent on measures for removal. When the symptoms are not ameliorated, they become obsessed with the idea that the procedure has not been complete and, in many instances, secure another consultant to repeat the process. No plan of treatment could be more detrimental to the interests of the patient.

Nature has arranged her forces to expel the uterine contents when they have completed their function or when they are no longer in condition to continue it. In addition, she affords ample protection against infection unless her barriers are injudiciously broken down. Every examination and all manipulation of the genital structures of an aborting patient should be strictly aseptic and, when such conditions are difficult to attain, the vulva should be kept covered with clean napkins wrung out of a mixture of equal quantities of alcohol and water, while pituitary extract should be administered hypodermically to promote expulsion of the contents and closure of the vessels.

EDWARD L. CORNELL.

Werner, P.: Study of Kidney Function in Normal and Diseased Women During Pregnancy and the Puerperium (*Untersuchungen ueber die Nierenfunktion bei gesunden und kranken Schwangeren und Wucherinnen*). *Arch. f. Gynak.*, 1915, clix, 471.

Werner performed the lactose, iodine, and phenolphthalein tests for kidney function repeatedly in a large number of cases of normal and abnormal pregnancy and puerperium. Of the cases 28 were of puerperal eclampsia, 23 of them primip-

ara. None of the eclampsia patients died. Of the other cases 10 showed the kidney of pregnancy, and in 3 of these cases it was very severe, ending in eclampsia. In 3 cases nephritis developed during the pregnancy. Nine patients showed pregnancy glycosuria, but the tests of kidney function did not disclose any abnormality. Seven of the patients had pyelitis, but the tests showed the kidney function to be normal, as the tubular system of the sound kidney seemed to be capable of performing all the work of the two. The tests showed functional impairment in the cases where both kidneys were affected.

The kidney tests were also applied to 15 women who had had laparotomies performed under a general anæsthetic and to 8 women with valvular disease. They were also applied to 30 healthy women pregnant for the first time and near term. In 4 cases autopsy confirmed the findings of the tests.

The conclusions that Werner draws from this abundant material are as follows:

1. The lactose test shows no change in the function of the kidney in normal women during pregnancy or the puerperium.
2. The phenolphthalein test shows a slight diminution in kidney function, though at times the function of the tubules is more active than normal.
3. After long operative deliveries under general anæsthesia the tests show some injury of the function of both glomeruli and tubules, but this seems to be only of short duration.
4. In cases of pregnancy complicated by moderately well compensated valve lesions the iodine and phenolphthalein tests showed good kidney function, but in many cases the lactose test showed some injury of the kidney.
5. In the so-called glycosuria of pregnancy there was some disturbance in the function of the glomeruli, but that of the tubules was normal.
6. In the cases of goiter there was frequently glycosuria after the lactose test, indicating a functional weakness of the glomeruli.
7. In nephritis during pregnancy there was severe disturbance of the function of both glomeruli and tubules; but the tubules soon recovered after delivery while the glomeruli were not improved.
8. There are two forms of nephropathy in pregnancy, one with and one without injury of the glomeruli; the former shows a tendency to pass into chronic nephritis after the termination of the pregnancy, and in both there is a wide variation in the response to the iodine test. The time till the elimination of the iodine was complete varied from 30 to 60 hours.
9. The functional tests with lactose and iodine are of value in differentiating between true nephritis and nephropathy, and in determining the prognosis of the latter. The response to the functional tests is about the same in eclampsia as in the "pregnancy kidney."

A. Goss.

Halpenny, J.: Dermoid Cyst Free in Abdomen During Pregnancy. *Canad. Pract. & Rec.*, 1915, xl, 532.

The case is reported of a woman four and a half months pregnant who had an attack of sharp pain in her right abdomen, which persisted with occasional exacerbations for three days. She vomited and the abdomen was rigid over the right lower quadrant. Operation showed a gangrenous dermoid cyst with twisted pedicle, which had become entirely detached. D. H. Boyd.

LABOR AND ITS COMPLICATIONS

Van de Velde, T. H.: Abnormal Delivery from Defective Development of the Uterus (*Geburtsstörungen durch Entwicklungsfehler der Gebärmutter*). *Monatschr. f. Geburtsh. u. Gynäc.*, 1915, xlii, 307.

The author gives a short review of the different forms of malformation of the uterus. Uterus unicornis is not of any special importance in obstetrical practice. Duplications of the uterus and vagina may appear in various forms, which are described and illustrated, and may cause serious interference with delivery. Delivery may also be interfered with by infantilism or hypoplasia of the genitalia and by congenital anomalies of the cervix. In uterus duplex delivery may be uneventful.

Twin pregnancies seem to be relatively frequent. Sometimes the second foetus may be retained, and cases have been described in which this was the first thing that indicated a double uterus. But in cases where there is only one foetus its delivery may be hindered by the non-pregnant half of the uterus, just as it would be by a myoma or a cystoma. The musculature of the uterus is apt to be weaker than normal, so that forceps delivery is frequently required. The cervix is apt to be rigid and the axis of the foetus and uterus slanting with respect to the pelvic inlet, which explains the rupture of the uterus in some cases. In some cases delivery is prevented by atresia of the pregnant half of the uterus. The diagnosis is easily overlooked in these cases.

Tissier describes a case in which version had been done and the placenta had been separated by hand, but a double uterus was not suspected until laparotomy became necessary, and its presence was discovered. Van de Velde describes a case of his own in which a foetus had developed to term in a half of a uterus that had no opening into the vagina. There was an opening into the other half, and the child was delivered by vaginal cesarean section. The woman became pregnant several times later, once in the same half and twice in the other, but none of the pregnancies came to term. She later developed tubercular peritonitis, for which a laparotomy was performed, and the anatomy of the case was studied carefully. There have been several similar cases reported, but no satisfactory explanation has been found as to why pregnancy should

develop in a uterus that had no external opening and that had never menstruated. After an artificial opening had been made this half of the uterus menstruated as regularly as the other. In such cases vaginal operation is to be preferred, unless the vagina shows anomalies of development that interfere with successful operation, in which case abdominal cesarean section is indicated. A. Goss.

Price, N. G.: Spontaneous Evolution of a Transverse Presentation. *J. Am. M. Ass.*, 1915, lxx, 1547.

The patient, a stocky young primipara, aged 30, height 4 ft. 10 in., weight 140 pounds, was admitted into the hospital in advancing labor. Her pelvic measurements were those of a slightly justomajor pelvis; interspinous 27, intercostal 30, and external conjugate 22 cm. When the bag ruptured and the right arm prolapsed, as also some coils of cord, which had no pulsation, the author was summoned to the case. The diagnosis was a left scapulo-anterior, and ether was given in expectation of doing a version or decapitation.

Before she was fully under the anæsthetic, the shoulder rotated forward under the pubic arch, sank downward, and became visible at the vulva. With the next pain, which was unusually violent, the dorsum, laterally bent, appeared, then the buttocks, legs, posterior shoulder, and arm. The head still remained in the pelvis. Tilting the trunk toward the abdomen of the mother and making moderate traction effectually liberated it.

The foetus had some noteworthy characteristics: It was the size found in an eight-months' pregnancy and weighed 5.5 pounds. It showed signs of commencing maceration, as evidenced by peeling of the skin in several small areas. The neck was peculiarly elongated so that it had a diameter of 1.5 inches. The head was of a conical shape and terminated with a meningocele. All the cephalic bones were widely separated, and the umbilical cord, more than a yard long, tapered almost to a point at its umbilical insertion.

Outside of a slight rise of temperature the first four days of the puerperium, which was probably sapremic, the patient made an uneventful recovery.

EDWARD L. CORNELL.

Beach, R. M.: Management of Placenta Prævia. *Long Island M. J.*, 1915, ix, 401.

The author discusses seven methods of treatment of placenta prævia and then gives his own ideas of the treatment. This is followed by a summary of 64 cases of placenta prævia delivered in the obstetric service of the Jewish Hospital, Brooklyn, during the past seven years.

That this condition is a dangerous one is proved by the mortality statistics; the maternal mortality being rated from 4 to 18 per cent and the fetal mortality 61 and 55 per cent by DeLee and McDonald respectively.

There can be but one safe and sane method and

that is to empty the uterus by the procedure which will preserve the mother's life and the integrity of her pelvic structures and at the same time give the baby the best possible chance for its life. The only exception to this rule of emptying the uterus immediately is the woman whose baby is nearly viable, who has bled only slightly, and who will place herself in the hospital under the constant supervision of trained nurses and attendants. "We may temporize," the author says, "under these circumstances, even pack the vagina for a period of eight to twelve hours in an effort to stop the bleeding." If a second hemorrhage occurs, however, the indication is to terminate the pregnancy.

The principles of treatment are four in number, namely: (1) to check the hemorrhage and keep it controlled; (2) to procure labor pains and dilatation of the cervix; (3) to prevent infection; and (4) to combat the shock and anemia.

The different methods of treatment are as follows:

1. Simple rupture of the membranes. This is the simplest method of treatment but is only applicable to the marginal and lateral implantations of the placenta with either a breech or vertex presentation.

2. Vaginal tampon. The author can see only three possible indications for the use of the tampon: (1) To control the bleeding during transport of the patient to the hospital; (2) Bleeding in the presence of a rigid cervix, in order to procure some dilatation; (3) a tamponade by the interne in the presence of alarming hemorrhage while waiting for the surgeon. As a routine treatment of placenta previa the tampon has no place, for it will only control bleeding for a short time and then only if the presenting part, especially the head, is in or very near the brim. The tampon merely soaks up the blood; and the danger of sepsis is also very great.

3. *Accouchement forcé* has no place in the management of placenta previa. Troub gives the mortality of *accouchement forcé* for placenta previa as 18.2 per cent.

4. Braxton Hick's or bipolar version. This is one of the oldest and for the mother probably the safest mode of procedure, its only drawback being the high fetal mortality. The most important thing in treating any case of placenta previa is to save the woman all of the blood that is possible and the Braxton Hick's version certainly does this. The advantages of the bipolar version are that it is sure in its results if done correctly; it requires but one manipulation and one anesthetic; it introduces no foreign body to cause infection. It is without doubt the best method for use in a private dwelling. Its only disadvantage is an increased fetal mortality as compared to the bag method.

5. The metوترyuter. Just as the bipolar version marked an improvement in the maternal statistics so has the use of the water bag meant a betterment in the fetal results.

The unfavorable feature of the bag method is that when the bag is introduced the work is only half done. When it is expelled through the cervix

the accoucheur must be prepared to act, as there may be an alarming hemorrhage. If the presenting part does not come down and control the bleeding, delivery by forceps or version must be done. This means another anesthetic and more blood loss than by the bipolar method but the immediate extraction means more live babies.

6. Vaginal caesarean section for placenta previa was first performed by Basam, but the method today has but few exponents. The author believes the method is indicated between the sixth and seventh months when the cervix is rigid and the baby can be disregarded. After the seventh month the technical difficulties are so great as to almost preclude its use.

7. Abdominal caesarean section for placenta previa was first recommended by Lawson Tait. Its routine adoption in all cases is certainly wrong and even though it may give better statistics for both mother and baby, its use is not warranted unless the patient is sterilized or the Porro operation is done. The author thinks that the time will come when either a primipara or a multipara at or near term with a live baby and a placenta previa centralis will be the subject for a caesarean section, especially if the cervix seems to offer any degree of dystocia whatever.

The author's ideas are summarized as follows:

1. In the private house, placenta previa with active hemorrhage is best treated by either rupture of the membranes or the Braxton Hick's version, the latter being the safest procedure.

2. In the hospital, between the sixth and seventh month with a rigid cervix the vaginal caesarean is indicated. Otherwise pack for 24 hours and then do a bipolar version.

In the partial and central varieties with a live baby the bag should be used. If the baby is dead or dying the bipolar version should be used. In any case after the seventh month if the mother is weakened by loss of blood, the Braxton Hick's version is the method of choice.

In the centralis variety at or near term, with a live baby and mother in good condition, if the cervix seems to offer any degree of dystocia abdominal caesarean section is the operation of choice.

All dead babies should be perforated. The patient should always be allowed to deliver spontaneously.

Summary of cases of placenta previa:

There were 64 mothers and 66 babies, twins being twice noted.

Maternal mortality, two mothers died, 3.1 per cent. Fetal mortality, 68.2 per cent.

The placenta was incomplete in 40 cases and complete in 15 cases. The treatment was about equally divided between the bag, Braxton Hick's and internal version. Tamponade was used only nine times ante partum and then only to get dilatation enough for some other procedure. The tampon to control bleeding was found to be but temporary, many cases bleeding through in two to four hours and before dilatation had in any sense progressed.

One very interesting feature was the lack of

sepsis, the case that died being practically the only one. The mortality was particularly low. The results were ascribed to cleanliness and the avoidance of the use of the tampon both ante-partum and post-partum.

A post-partum tampon was used only 11 times in 64 cases, although there were 15 cases of central placenta in the series. Of the 11 cases which were packed post-partum, 10 cases were traumatic deliveries, so to speak, cases where internal version with immediate extraction, or Braxton Hick's version with later extraction were performed. In the 10 cases there were 5 cases of internal version with immediate extraction, two bipolar versions with later extractions, one each after forceps, craniotomy, and perforation of the after-coming head. Only one case was tamponed after bipolar version and spontaneous delivery.

In contradistinction to these cases there were 20 cases of Braxton Hick's version where it was not necessary to use packing.

RALPH H. KUHN.

Williams, J. W.: Premature Separation of the Normally Implanted Placenta. *Surg., Gynec. & Obst.*, 1915, xli, 541.

After reviewing the history of the subject the author states that premature separation of the normally implanted placenta occurs much more frequently than is generally believed, and in his experience is more common than placenta prævia. In the last 2,000 labors which came under his observation the two conditions were noted in 17 and 14 instances, respectively. In this series of cases the degree of separation varied from areas measuring 3 x 5 cm. to the entire organ. All were attended by external hæmorrhage, but several were complicated by concealed hæmorrhage as well. None of the patients died; 9 were delivered by the unaided efforts of nature, and 8 required operative interference.

The main part of the article is based upon two cases of complete separation of the placenta, one giving rise to absolutely concealed, and the other to concealed and external, hæmorrhage. Both patients were primiparous women; in one the accident occurred without warning before the onset of labor, while in the other the cervix admitted the tip of the finger, so that cesarean section was deemed the most conservative method of effecting delivery and of giving the uterus a chance to control the hæmorrhage by its contractions. In both instances the uterus presented a peculiar bluish, purplish, coppery appearance, resembling that of an ovarian cyst with a twisted pedicle. After it was emptied it presented the consistency of wet leather and absolutely failed to contract. Supravaginal hysterectomy was therefore done and both patients recovered.

Examination of the amputated uteri showed that the discoloration was due to such an effusion of blood into the muscularis that the muscle fibers were completely disassociated. Similar changes were also noted in the broad ligaments, tubes, and

ovaries. Many of the uterine veins were thrombosed, and the smaller branches of the uterine artery presented a peculiar degeneration of the intima. The anatomical features are shown by a colored plate and several black and white drawings.

These findings render it probable that the cause of the accident is associated with the circulation of some toxic substance in the blood, which causes degenerative changes in the arterioles with subsequent free hæmorrhage into the muscularis. The disassociation of the muscle fibers also explains the extreme shock which sometimes characterizes the accident, when the loss of blood is comparatively slight, and offers a satisfactory explanation for the failure of the uterus to contract, with death from atonic hæmorrhage after the patient has been successfully delivered.

In view of these findings, which are confirmative of those of Couvelaire and others, the author considers that cesarean section offers the ideal method of delivery in patients presenting serious symptoms early in labor, and he likewise holds that supravaginal amputation is indicated if atonic hæmorrhage follows delivery. Radical interference, however, is not generally necessary, as the two cases here reported are the only ones in the author's experience which seemed to demand it.

In one case the urine was normal both before and after operation; while in the other considerable quantities of albumin were present before delivery. As small quantities persisted until the patient had left the hospital, nephritis was presumably present, but as it was clearly absent in the other case, it cannot be invoked as a universal cause. Consequently the author is inclined to attribute the serious cases in the series to the circulation in the blood of some toxic substance which differs from that concerned in pre-eclamptic or nephritic toxæmia. He admits that trauma may occasionally be an etiological factor, but does not believe that inflammatory conditions of the decidua or muscularis play any part in the production of the accident, and holds that when such lesions are present they should be regarded as accidental complications.

Kehrer, E.: Loosening and Rupture of the Symphysis (Symphysenlöserung und Symphyse-ruptur). *Monatsschr. f. Geburtsh. u. Gynæk.*, 1913, xli, 321.

One hundred cases of rupture of the symphysis have been reported in the literature up to date. Kehrer gives brief case histories of these and a bibliography of 100 titles, in addition to a detailed case history of his own. His patient was a III-para with a contracted pelvis. Her other children had all been stillborn and high forceps had been applied repeatedly, with external compression of the head into the pelvis, the woman being in the Walcher position. The symphysis ruptured during the application of the high forceps. The urethra was torn loose and the neighboring ligaments were torn. The sound of the tearing could be heard and a gap

as such wide could be felt in the symphysis. The head came through at once. The patient died after 15 days from embolism of the pulmonary artery.

To understand the ruptures of the symphysis that take place during pregnancy, labor, and the puerperium it is necessary to have a thorough understanding of the anatomy and physiology of the articulation of the symphysis. The slight gaps and small tears that are often seen physiologically in the symphysis do not entirely explain its tendency to more extensive ruptures. During pregnancy there is a certain degree of physiological loosening, enlargement, and increased elasticity of the ligaments of the symphysis, which may first cause an abnormal mobility of the articulation. This abnormal mobility may lead in the course of the pregnancy to a certain weakness in the symphysis and other pelvic articulations and even to some interference with walking. It is only a short step from this abnormal mobility to separation of the ends of the pubic bone. Rupture of the symphysis takes place most frequently in operative deliveries. The head or shoulders that are being removed by forceps or the cranioclast may cause rupture of the symphysis as they enter or pass through it. Rupture is further favored by operative delivery in the Walcher position with the legs spread apart; but rupture occasionally takes place during spontaneous delivery. Contracted pelvis is a predisposing factor. Generally contracted and funnel-shaped pelves, and those affected with osteomalacia, are especially predisposed to rupture.

There are three degrees of rupture of the symphysis: (1) loosening and overstretching of the ligaments, especially the arcuate ligament and the superior pubic ligament, with or without the formation of gaps in the cartilage; (2) partial rupture of the ligaments, generally during delivery, but occasionally even during pregnancy; (3) complete rupture of the ligaments. Rupture of the symphysis may be recognized by a number of signs. There is generally a distinct noise when the rupture takes place and the woman feels as if something had torn. The presenting part of the child suddenly sinks down. If the region of the symphysis is palpated the skin can be pressed down in a groove and the gap between the ends of the bones can be felt. When the rupture takes place while the patient is under an anesthetic it may not be noticed, and the reason for the pain and tenderness in the region may not be discovered for days. Generally there is a characteristic position of the lower extremities. The legs are abducted and the knees and feet turn outward so that they lie on the outer side of the leg. There may be severe injuries of the bladder and urethra. Hematomata or edema of the labia majora and slight fever, even when the delivery is aseptic, are quite commonly observed.

In the older literature, dislocation, interference with walking, and reduced capacity for work were frequently reported after rupture of the symphysis,

but in the later cases the results have been less serious. Most authors advise the wearing of a pelvic girdle in the treatment of rupture of the symphysis. Primary suture of the bone may have to be resorted to in open rupture. In the cases complicated by rupture of the bladder and urethra the tissues around the symphysis should be drained. If the patient becomes pregnant again artificial delivery should not be attempted and every care should be exercised to avoid rupture. The pelvis should be supported by a band and spreading of the knees avoided.

A. Goss.

Phillips, W. D.: Use and Abuse of Forceps. *West. M. Times*, 1915, XLV, 221.

The chief abuses of forceps are in high applications and in contracted pelves. The condition most often requiring forceps application is uterine inertia, frequently associated with resistant perineum in primiparae. Occipitoposterior positions with incomplete rotation may require forceps.

In a series of 253 cases, forceps were applied 41 times with a fetal mortality of 2.5 per cent. The indications were: uterine inertia with resistant perineum, 20 cases; occipitoposterior positions, 9 cases; slightly contracted pelvis, 6 cases; prolapsed cord, 1 case; threatened eclampsia, 2 cases; aftercoming head in breech, 2 cases; placenta previa, 1 case.

High forceps were used in 8 cases, with a fetal mortality of 13 per cent; midforceps in 10 cases with a negative fetal mortality; 23 low applications with a negative fetal mortality.

The author emphasizes the necessity of studying individual cases; the importance of careful pelvic measurements; the condemnation of the general application of high forceps; and the use of forceps in prolonged second-stage labor with normal indications.

D. H. Boyd.

Norris, R. C.: Anesthesia in Labor. *Therap. Gaz.*, 1915, xxxix, 685.

Norris briefly reviews the various methods that have been used to relieve the pains of childbirth. He characterizes sacral and spinal anesthesia as impractical, nitrous oxide as too expensive and as requiring a skilled anesthetist, chloroform as dangerous on account of its tendency to cause tissue asphyxia in the mother and visceral changes and haemorrhagic diseases in the fetus. Ether is safe, but administered intermittently as an analgesic is apt to intoxicate the patient and make her noisy and uncontrollable.

The real problem of anesthesia in the highly neurotic primipara is the first stage. During the period of dilatation the author administers ten grains of chloral repeated once or twice at four-hour intervals with one-sixth of a grain of morphia given once. Ether analgesia is started with the second stage pains. In patients of this type the Freudberg technique has its chief value. The author does not believe that "twilight sleep" should be administered

wholesale to all patients but that each case should be considered separately and the most appropriate form of anaesthesia used. An inefficient labor should be promptly terminated by operative means. A vain attempt to demonstrate the advantages of normal delivery under any form of narcosis after progress has ceased will only end in disaster.

F. C. IRVING.

Schloessingk, K. E.: Scopolamine-Morphine, Scopolamine-Pantopon, and Scopolamine-Narcophin in Labor. *Med. Times*, 1915, xliii, 311.

Since the *daemmerschlaf* anaesthesia has been introduced in obstetrics, morphine, narcophin, and pantopon have been used as opiates in conjunction with scopolamine stable. It is not difficult to trace the unsatisfactory results reported by some authors of twilight sleep investigations to one of two causes; viz., either wrong technique or the use of wrong drugs.

The greatest difficulty in applying the *daemmerschlaf* anaesthesia is in the use of the opium preparation, on account of its ill-effect on the respiratory center of the baby; and according to reports mentioned by the author, the great number of oligopnoeic babies when using morphine; so that narcophin and pantopon have more and more taken its place.

Schloessingk states that he has personally used narcophin in Freiburg and in America in a great many cases with satisfactory results, the Freiburg custom being to use pantopon mostly for the *daemmerschlaf* before surgical operations and narcophin for the *daemmerschlaf* in obstetrical practice.

The technique of the scopolamine—pantopon anaesthesia before surgical operations in Freiburg is described as follows: Scopolamine 1/400 grain and pantopon 3/5 grain are given two and one-half hours before, and a second injection of the same dose, three-fourths hour before, the operation. If the *daemmerschlaf* is not complete with these two injections another injection of the same sized dose is given. Only in very cachectic and old patients is the dosage reduced to half the amount.

For the scopolamine-pantopon treatment in labor, the technique is the old Freiburg method, giving only one injection of pantopon, 3/5 gr., except in very long or restless or extremely painful cases, where half the dose of pantopon is repeated.

The author reports a few typical cases of scopolamine-pantopon treatment and states that in 30 cases, 22 had full amnesia, 6 partial amnesia, and 2 cases were failures, as no amnesia or analgesia was produced.

He is of the opinion that he produced quicker analgesia with pantopon than with narcophin, but that the patients came somewhat later in "*daemmerschlaf*." The frequency and strength of the pains were not decreased.

W. D. PHILLIPS.

PUERPERIUM AND ITS COMPLICATIONS

West, H.: Puerperal Infection; Its Prevention and Treatment by the Country Practitioner. *Clinique*, Chicago, 1915, xxvii, 495.

West believes that the country practitioner may do much to prevent sepsis by intelligent prenatal care. Any existing anemia should be treated and the digestive and excretory organs properly regulated. After labor has begun, the strictest asepsis, both of the parturient and the physician, should be observed, and repeated vaginal examination should be avoided. The accoucheur should attempt to minimize the number and extent of perineal tears. Those which result should be immediately repaired, if possible. The delivery of the placenta should be accomplished by stimulation of uterine contractions and not by intravaginal manipulation. A careful inspection of the secundines should follow their delivery.

The curative treatment of puerperal sepsis begins with a thorough physical examination. Local measure should be confined to an aseptic inspection of existing lacerations and the removal of stitches if indicated. Should an increase of foul lochia with a moderately elevated pulse and temperature suggest sapremia, a digital exploration and evacuation of the uterus is justified, followed by a sterile douche of salt solution. This procedure, if not beneficial, should not be repeated. Under no other circumstances should the uterus be entered, and the use of the curette is always unjustified.

General treatment consists in hygienic measures, fresh air, liberal nourishing diet, and an abundance of liquids. Fever and restlessness are best controlled by hydrotherapy. Fowler's position favors drainage and aids pelvic localization of the infection. Alcohol is the most satisfactory stimulant.

F. C. IRVING.

MISCELLANEOUS

Reynolds, E.: Prognosis of Sterility. *J. Am. M. Ass.*, 1915, lxx, 1151.

In spite of the extremely unsatisfactory state of scientific knowledge relative to the chemistry of the reproductive organs and their products, it is, however, possible to obtain very satisfactory practical results in the prognosis of individual cases by the assumption of the following working hypotheses:

1. When the spermatozoa are abundant in number, normal in form and appearance, furnished with long cilia, and capable of rapid movement through the semen, the male is satisfactorily fertile.
2. When normal spermatozoa are killed or lose vitality overrapidly in the secretions of the individual woman, the chemico-physiologic character of her secretions furnishes an effective cause of sterility.
3. The alterations in a secretion which make it fatal to the spermatozoa may be localized in the vagina, in the cervix, in the body of the uterus or in one or both tubes; and any one of these alterations

may exist with normal secretions above it, but an alteration in the secreting surface in any of these localities usually vitiates all the secretions below it, probably by their necessary admixture.

4. When the spermatozoa are observed to penetrate without apparent loss of vitality to the fundus of the uterus and to survive there for a normal length of time, deficient quality of the ova may be considered the probable cause of the sterility.

If the vaginal pool, when submitted to the Hübner microscope, contains no spermatozoa, alive or dead, the probability is strong that the man is aspermatic and this should then be confirmed by direct examination of the semen as obtained by expression or from a condom specimen. Such aspermia may be merely temporary and is frequently neither permanent nor hopeless. If the vaginal pool contains an abundance of spermatozoa which are either dead, or at best feebly motile, at the time of a reasonably prompt examination, the character of the vaginal secretion is probably responsible for their death and should, in most cases, be altered by treatment, but the importance of the vaginal condition is much affected by the size and position of the os uteri. There are not a few cases of widely opened os, with normal cervical secretions, in which a reasonable number of living spermatozoa succeed in entering the cervix in spite of a hostile vaginal secretion, that is, before it takes effect on them. If they succeed in entering the cervix in sufficient numbers and with sufficient vitality to be found later in the uterine mucus, the condition of the vaginal secretion is, of course, of but little importance. If, however, as is frequently the case, spermatozoa are found, in an apparently normal cervical secretion, either dead or in a condition of limited vitality while the majority of their brethren have been killed by a hostile vaginal secretion, it becomes probable that even the most successful ones were largely devitalized by the latter and its treatment is of the utmost importance.

Much the same thing may be said of the hostile conditions of the cervical secretion, but it is extremely interesting to see how often actively motile spermatozoa may be seen to progress across the field of the microscope in a cervical secretion of grossly normal appearance until they come in contact with some clump of pus-cells, which is evidently tied together by sticky secretion, with which the tail of the spermatozoon becomes entangled. The result then is that it indulges in futile struggles to escape, by the violence of which it may be seen to become exhausted and in a few minutes gives up the struggle and lies still. This is, of course, due to the admixture with normal serum of thick inspissated mucus from inflamed cervical glands. In these cases the cervical mucous membrane must, of course, be rendered normal before impregnation is likely to occur. This is unlikely to be effected to the degree of normality which permits of impregnation without an intelligent alteration of the size and shape of the os and cervical cavity by a plastic operation,

in addition to a curettage and thorough if not repeated disinfections of the mucous membrane.

These conditions, as actually seen under the microscope, amply demonstrate the reason for the almost invariable failure, in sterility cases, of the mere dilatation and curettage in which the general practitioner so often indulges, not infrequently, too, with results which permanently decrease his patient's chance of fertility under any treatment. At least such has been the result of the author's observations in this class of cases. EDWARD L. CORBELL.

Newell, F. S.: *The Blood-Pressure During Pregnancy*. *J. Alumni Ass. Coll. Phys. & Surg.*, 1915, xviii, 65.

The author's deductions are based upon a study of blood-pressure and albuminuria in a series of 430 cases. Observations were made every ten days. In this series 421 cases maintained normal blood-pressures, that is, between 100 mm. and 130 mm., throughout pregnancy. None of these patients developed trouble from toxæmia except one who developed post-partum eclampsia. A careful study of the 29 patients with abnormal pressures — above 150 mm. — caused the author to reach the following conclusions:

1. If the blood-pressure remains persistently below 100 it is fair to assume the patient's general condition is below par. Temporary low pressure is of no significance.
2. A persistent rise in blood-pressure even though it may never reach the arbitrary danger line calls for careful attention.
3. The significance of small amounts of albumin in the urine, the blood-pressure remaining normal, is negligible.
4. A rise in blood-pressure followed by the appearance of albuminuria indicates the development of toxæmia.
5. High blood-pressure, in the absence of other signs, is not necessarily a dangerous symptom, although it should arouse suspicion. W. H. CARY.

Runge, E., and Gruenhagen, E.: *Roentgen Measurement of the Pelvis* (*Zur röntgenographischen Beckenmessung*). *Monatsh. f. Geburtsh. u. Gynæk.*, 1915, xlii, 292.

One of the most difficult problems in roentgenology has been the accurate measurement of the pelvis. The methods proposed by Kehrer-Deasauer and von Heynemann were great improvements over those formerly in use, but even they were subject to considerable error. The authors believe that they have found a method by means of which these inaccuracies can be overcome. They use a stereoscopic technique. Two pictures are taken, one after the other on two plates, with the patient lying in the same position, flat on her back. For the second stereoscopic picture the tube is moved about 6.5 cm. The impression from both negatives is taken on the same sheet of paper and the measurements are computed by an algebraic or geometrical

formula. The method of making the computation is described.

The authors have not had an opportunity to test the method on women since it has been completely worked out, but they have tested it on men and had an opportunity to test their measurements at autopsy afterward. They found either exact agreement with the figures that they had computed or else a variation of only a fraction of a millimeter which makes no practical difference. They believe the principle of the method is absolutely correct and urge that it be tested further on pregnant women.

A. Goss.

Slemons, J. M.: Placental Bacteræmia. J. Am. M. Ass., 1915, lxx, 1265.

Five hundred consecutive confinements in the University of California Hospital have been studied. Including infants over 40 cm. long, the mortality was 5.4 per cent, or 27 cases. The infant was still-born in 21 cases; it died on the second day in 3, on the fourth in 2, and on the ninth in 1 case. A necropsy was performed in every instance. The causes of death were as follows:

	Cases	Per cent
Syphilis	7	26
Birth injury	0	22
Premature separation of placenta	4	15
Placental bacteræmia	3	11
Congenital heart lesion	2	7
Enlarged thymus	1	3
Toxicæmia pregnancy	1	3
Undetermined	3	11

A number of well-known factors combine to explain why the foetal mortality is higher in cases where labor is prolonged. In 62 patients, labor lasted longer than 24 hours, and in this group 8 foetal deaths occurred—13 per cent. Three of the deaths were due to placental bacteræmia. The mothers of these infants were not seriously ill and, at the end of two weeks, were discharged from the hospital in good health. Such results, however, are not always to be expected. EDWARD L. CORNELL.

Mayer, A.: Intracranial Hæmorrhage in the Newborn (Ueber die intrakraniellen Blutungen des Neugeborenen infolge der Geburt). Zentralbl. f. Gynæk., 1915, xxxix, 795.

Intracranial hæmorrhage in the newborn is not nearly so frequent as external hæmatomata, but it probably occurs much more frequently than it is recognized. Henschen reported 29 cases among 1,277 deaths of newborn babes at the Zurich Obstetrical Clinic, or 2.27 per cent; this corresponds to 0.2 per cent of the number of births during this time.

The hæmorrhage is generally subdural; bleeding also occurs below the tentorium in the region of the

cerebellum. These generally occur as a result of rupture of the tentorium. The source of supratentorial hæmorrhage is generally a rupture of the superior longitudinal sinus or of the veins emptying into it. The cause of intracranial hæmorrhage is not always clear. A good many cases occur during operative delivery and may be assumed to be due to too great pressure during delivery. Three such cases are described. But from 40 to 50 per cent of the cases occur during spontaneous delivery. Many of them are seen in cases where there is disproportion between the size of the head and the birth canal, as in contracted pelvis, unusually large child, or rigid soft parts in elderly primiparæ.

Among 13 cases of subdural hæmorrhage Seitz reported 7 primiparæ, 4 of them over 30 years old. In these cases the bones of the head are pushed together more forcibly than normal, rupturing the sinus or veins. But there are a certain number of cases that occur in perfectly normal deliveries in multiparæ, where no such causes exist. Twelve such cases are reported. These cases may be due to circulatory disturbances brought about by the sudden change in pressure inside and outside the os. An incompletely dilated and resistant os may also press the bones together too forcibly. Asphyxia may cause disturbances in heart action and circulation that produce hæmorrhage. There are also certain predisposing factors in the child. The head may be abnormally large, necessitating unusual force to deliver it, or in premature infants the tissues may be abnormally soft and friable. Syphilis predisposes to hæmorrhage, as do also certain conditions in the mother, including eclampsia.

Many of these children are asphyxiated when born and cannot be saved. Some of those born alive develop normally. The child's skull dilates readily and the effusion of blood may be absorbed. But in many cases the normal development of the brain is prevented by the pressure of the blood, and many conditions such as idiocy, chorea, spastic paralysis, and chronic epilepsy are doubtless sometimes caused by it. Neurologists are inclined to attribute great importance to birth lesions in the production of these conditions, while obstetricians are inclined to deny it.

It is difficult to make an absolutely certain diagnosis of intracranial hæmorrhage, but it is indicated by certain general symptoms, such as restlessness, somnolence, disturbance of respiration, and general convulsions; there are also local signs such as tension of the fontanelles, wide sutures and localized convulsions which help to indicate the site of the hæmorrhage. Operative treatment is indicated. Cushing reports operation on 16 cases with 7 recoveries, or 43.75 per cent. In infratentorial hæmorrhage lumbar puncture is valuable.

A. Goss.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Braasch, W. F.: Perinephritic Abscesses. *Surg., Gynec. & Obst.*, 1915, XL, 631.

The 101 patients operated on at the Mayo Clinic for abscesses in the perirenal area have been subdivided into two groups: subdiaphragmatic, 34 cases, and perinephritic, 67 cases. Direct renal etiologic conditions were determined in all but 14 of these cases. The various factors found as causes of perinephritic abscess are: (1) pyonephrosis, (2) renal tuberculosis, (3) nephrolithiasis, (4) cortical abscess, and (5) traumatic rupture.

Of the cases caused by cortical abscess several were characterized by the presence of a single abscess, which after being drained were followed by recovery. The author believes that the diagnosis of perinephritic abscesses of renal origin would be increased without employing the following tests: (1) repeated urinalysis; (2) bacteriologic investigation of the urine catheterized from each kidney; (3) estimation of the comparative renal function; (4) radiologic examination, including that of the urinary tract and the thorax, and pyelography.

Following Baum's suggestion, Braasch has found the bacteriologic examination of the urine to be of value in the diagnosis of perinephritic abscess when the urinary data were otherwise negative or doubtful. He finds the differential renal functional test, and phthalein in particular, of value in similar conditions. In the presence of previous obscure renal infection pyelography may be of value. The position of the diaphragm may be revealed by a thoracic radiogram when displaced by a subdiaphragmatic abscess. The operative mortality in the 67 patients was a per cent. Immediate nephrectomy is indicated when the renal condition previously ascertained warrants it.

Chute, A. L.: Some Errors in the Diagnosis of Renal Infection. *Surg., Gynec. & Obst.*, 1915, XL, 426.

Chute believes that the greatest cause for errors in the diagnosis of renal infections is a lack of appreciation on the part of the general practitioner of the conditions under which renal infection gives pain and the sort of pain that such an infection usually gives.

He believes that only a condition which suddenly puts tension on the kidney capsule causes renal pain, and that the pain from an infection of the kidney is rarely backache, but has a tendency to be generalized abdominal pain, frequently accompanied by vomiting.

Another point that may mislead the general

practitioner is the apparent lack of renal tube casts, in their absence frequency and urgency of urination, even with a considerable amount of albumin and probably an elevation of temperature, is attributed to cystitis. Consequently the possibility of renal infection is not brought to the mind of the man who sees the patient originally, and measures for accurate diagnosis are not applied.

Sometimes when the chance to use accurate diagnostic means is given, one is unable to apply them, either because of the circumstances under which the patient is seen or because of some physical impediment. In other cases the conditions seem so evident that the application of the exact means does not seem necessary or worth while.

No matter what the immediate reason, the underlying cause for errors in the diagnosis of renal infection is the fact that for some reason, avoidable or unavoidable, the methods of exact diagnosis have not been applied.

Chute illustrates his points by citing definite cases in his experience.

Newman, D.: Hematuria, a Symptom: Its Causes and Diagnosis, with a Few Cases Illustrating Some of the Less Common Lesions. *Glasgow M. J.*, 1915, LXXXIV, 263.

In the concluding part of the article, the author considers the information obtained by other constituents of the urine besides blood, such as pus, tumor-cells, parasites, tubercle bacilli, etc. Also of importance are the time at which the blood appears in the urinary stream, the frequency and duration of the attack of hematuria. Blood at the beginning of micturition indicates a lesion in the urethra, or prostate, or close to the neck of the bladder; when terminal, it is likely to be due to bladder tumor or vesical calculus.

Hematuria of sudden onset and disappearance occurs in movable kidney with torsion of the renal veins, also in renal calculus, tumor of the renal pelvis, and aneurism of the renal artery.

Hematuria which is severe and persistent, on the other hand, is suggestive of advanced malignant disease or soft papilloma at the neck of the bladder. Intermittent hematuria, more or less profuse, is seen in tumor of the bladder well away from the neck.

The methods and technique of determining the source of blood when from the upper urinary tract are considered; tests are described by which the quantity of hemoglobin in the urine may be estimated for the purpose of determining whether or not the albumin present is due entirely to blood, or due in part to some other cause.

In discussing diagnosis in cases of hæmaturia, the conditions in which bleeding is the only symptom are first taken up. These are passive hyperæmia, renal varix, tumor in the renal pelvis, aneurism of the renal artery, and early renal tuberculosis.

In the absence of evidence furnished by X-rays, chemical, physical, and bacteriological examination of the urine, in renal varix and passive hyperæmia, the chief reliance is upon cystoscopy, which must be performed both during the hæmaturia and during the intervals.

The shoots from the congested kidney are frequent, strong, and small, whereas from the opposite ureter, if its kidney is healthy, the shoots are larger, less forcible, and less frequent. Generally the ureteric opening on the diseased side is altered; it may be small, sharply defined, and the lips injected, or the edges may be swollen, œdematous, and stained with blood, or small blood-clots may be seen adhering to the opening.

In tumor of the renal substance or pelvis there may be fragments of the growth present in the urine. An important point in the diagnosis of aneurism of the renal artery which has ruptured into the renal pelvis, is the increase of efflux of blood into the bladder, as seen by cystoscopy, when pressure is made upon the kidney, the blood welling out in a steady, even stream.

In renal calculus causing hæmaturia, the author states the ureteral orifice usually becomes altered and, as a rule, urinary shoots are more frequent and smaller in size than those from the healthy side.

In early tuberculosis the lesion at the ureteral orifice varies somewhat, but practically always shows some deformity of the opening with thickening or retraction of one or both lips.

Lesions accompanied by other symptoms than hæmaturia are renal calculus, tumors, tuberculosis, trauma, polycystic kidney, hypernephroma, and adrenal tumors. Lesions of the bladder causing hæmaturia are tumor, cystitis, calculus, enlarged prostate, varicose veins, and diverticulum.

The characteristic forms and variations of the hæmaturia, the importance of certain symptoms in diagnosis in the above condition, and the more modern methods of examination are thoroughly considered.

H. BISSETT.

Cabot, H.: Errors in Diagnosis of Renal and Ureteral Calculus. *Surg. Gynec. & Obst.*, 1915, xxi, 403.

This report was compiled from a study of 153 cases of proved stone in the kidney and ureter studied at the Massachusetts General Hospital. Twenty-six abdominal operations had been previously performed on these patients without relief of symptoms. Of these, 10 were for appendicitis, 8 were exploratory, 4 were for fixation of a supposed movable kidney, and 1 each for supposed disease of the tube and gall-bladder, for abdominal adhesions, nephralgia, and stone in the bladder. It was pointed out that these errors could have been

avoided by careful examination of the urine and by taking X-ray plates.

Errors of a medical nature in the diagnosis in this group consisted of treating patients for ulcer of the stomach, lumbago, sacro-iliac strain, acute and chronic Bright's disease, chronic cystitis, and neurasthenia. It was shown that all of these errors could have been avoided by the application of well-known methods of diagnosis. The frequency with which the diagnosis of chronic nephritis is made where stone in the kidney exists shows that the effect of nephritis upon the cardiovascular system is not sufficiently recognized.

After discussing some of the more difficult technical problems of diagnosis, particularly the differential diagnosis between stone in the ureter and other foreign bodies, Cabot points out that by the observance of certain precautions practically all the errors which had been made in this series of cases could have been avoided. All cases of abdominal pain of a chronic type, backache, and sacro-iliac pain should have careful, repeated examinations of the urine and generally an X-ray taken before any operative procedure is decided upon. The evidence presented by the X-ray alone is regarded as insufficient to warrant operation for stone in the kidney or ureter. In the most obscure cases with a normal urine, a negative X-ray and an unobstructed ureter, the wax-tipped catheter would often give positive evidence not to be obtained in any other way.

Hinman, F.: Diagnosis of Ureteral Calculi; Technique for Use in the Wax-tipped Catheter in the Male. *Calif. St. J. Med.*, 1915, xiii, 432.

After discussing the plate diagnosis of ureteral stone, which Geraghty and Hinman on the basis of a recent study of the large material of the John Hopkins Hospital found to be erroneous in over 15 per cent, the author points to the frequent position of concretions in the pelvic portion of the ureter—about 70 per cent. The fact that ureteral stone is rarely ever located by the X-ray in that portion of the ureter corresponding to the shadow of the wing of the sacrum, has never received sufficient emphasis. Neither Kelly nor Fenwick saw a shadow in this portion of the bony pelvis. It is, therefore, very likely that stones do occur here and are missed in the X-ray examination.

Ureterography with an X-ray catheter or by the previous injection of some substance into the ureter which is impermeable to the X-rays will usually determine satisfactorily the intra- or extra-ureteral position of any suspicious shadows. Sometimes, however, a suspected shadow will appear to lie within the ureter, when it really lies either above or beneath it; positive evidence in such a case is only available by a scratch on a wax-tipped catheter.

In order to obviate the technical disadvantages connected with the application of this most important diagnostic method, Hinman has devised a simple procedure which permits the removal of the

wax-tipped catheter without previously removing the cystoscope and which at the same time enables the operator to pass one or more control wax-tips and thus confirm the findings. The comprehensive and lucid description of Hinman's method, which is illustrated by several excellent photographs, is not applicable to a short review and must be studied in the original article.

Summarizing the methods available at present for the diagnosis of ureteral stone, Hinman differentiates between the general investigation and the use of special methods of examination. Of importance in the former is radiography of both ureters, both kidneys and the bladder, a careful study of the urine before instrumentation, and determination of renal function. If negative findings after such a general study are obtained, further examination is not necessary. In the presence of suspicious but indefinite general findings the most trustworthy special methods of examination are the wax-tipped catheter and ureterography. The accuracy of the wax-tipped catheter and its applicability at one sitting with other cystoscopic methods warrant a wider and more general scope for its use in the future.

M. KRUTOSZYNER.

Newman, D.: Ureteral Calculus; Its Symptoms and Treatment. *Brit. M. J.*, 1915, II, 508.

In a review of the treatment of ureteral calculus, the author considers the expectant and operative methods with illustrations of each from personal cases. The expectant form is advised where but one ureter is blocked and the other kidney normal, especially when the obstruction is transitory or incomplete and the calculus is known to be small. Such cases when kept under careful and frequent observation often progress to a spontaneous cure.

Operative treatment is indicated without delay when the colic is frequent and severe, if there is evidence of hydronephrosis or sepsis, if the stone is known to be large or fixed, if there is only one working kidney, or if the patient's general condition is becoming impaired. The operative procedure depends on the position of the stone, but in the great majority of cases the lumbo-ilio-inguinal route is indicated. In opening the ureter the author prefers an oblique incision, rather than a longitudinal one, which may diminish the lumen of the duct in suturing. The incision in the ureter should be made above the point of impaction, and previous placing of stay sutures on each side of the line of incision facilitates removal of the stone and the closure of the ureter.

H. J. SARGENT.

Brausch, W. F., and Moore, A. R.: Stones in the Ureter. *J. Am. M. Ass.*, 1915, LV, 1234.

The authors have considered 229 operative cases of stone in the ureter and 64 cases in which the stone had been dislodged by cystoscopic technique or had been passed. They analyze and give the percentage of occurrence of the important findings. Various methods of non-surgical treatment are

mentioned and their value discussed. They review the various sources of error in diagnosis and give the occurrence of stone in their series.

Pain was referred to the renal area in 67 per cent of the cases; to the upper abdominal quadrant in 13 per cent; and to the region of the lower ureter in 9 per cent. In three cases the localization was in the suprapubic area and no definite radiation was noted in 16 cases; no pain in 5 cases. The authors believe that renal colic as a result of lithiasis is caused more frequently by stone lodged in the ureter than in the kidney. They emphasize the confusion that might arise with lesions in the upper abdomen when the pain is referred to that locality. In their experience the localization of pain referred to the area of the lower ureter has caused the most confusion, especially when on the right side. A history of previous colic referred to the renal area with subsequent localized pain to the lower ureteral area is suggestive of an impacted ureteral stone with periureteritis. Cases are noted of stone in the ureter which caused no pain. In 12 cases the degree of pain was secondary in importance to symptoms of gastric disturbance.

Vesical irritability occurred so frequently, 74 per cent, that its absence is of value in differential diagnosis. Irritability was the predominant symptom in cases in which the stone was lodged in the vesical portion of the ureter.

In the authors' experience the actual diagnostic value of the presence of a few red blood-cells or pus-cells in the urine in the diagnosis of ureteral stone has been exaggerated. They think, however, that the presence of a few elements in the urine necessitate a careful roentgenographic examination. The absence of red blood-cells or pus-cells does not exclude the possibility of stone. In 13 per cent of their cases no pus or red blood-cells were found; in 9 per cent only an occasional red cell, and in 7 cases an occasional pus-cell. Gross hematuria was found in 14 per cent with stone in the ureter, while with renal stone hematuria was found in 56 per cent of cases. They regard hematuria, therefore, as of less importance with ureteral stone than with renal stone.

Palpation of the stone in the lower ureter did not prove in their hands to have much diagnostic value in the male but not infrequently was of aid in the female. In 86 cases in which efforts were especially made to palpate stone, in only 9 was this procedure possible. The majority of ureteral stones pass spontaneously, and for this reason they believe that surgical interference is seldom indicated in the first attack of pain. Before an abdominal operation is attempted, the passage of the stone may be aided by endoscopic methods, namely: (1) catheter manipulation; (2) injection of sterile glycerine or oil; (3) fulguration; (4) ureteral dilatation; (5) cutting of the meatus; and (6) ureteral forceps. The authors were able to remove 64 stones by one of the above methods. The injection of oil and glycerine into the ureter was of questionable im-

provement over the natural efforts of peristalsis and ureteral lubrication. It is their impression that stones in the lower ureter which could be dislodged by the methods mentioned would pass spontaneously.

The greatest percentage of errors in the roentgenographic diagnosis occurred from incorrect interpretation of the shadow rather than from failure of the roentgenogram to show the shadow. A roentgenographic diagnosis of stone was made in 60 per cent of cases. The greatest percentage of error occurred in regard to extra-ureteral shadows as explanatory of abdominal pain and subsequent negative exploration. Next in importance was the interpretation of shadows as stone-shadows when caused by extra-ureteral conditions. Many stones failed to cast shadows. The roentgenogram was negative in 11 per cent, probably due to the following causes named in the order of their relative frequency: (1) errors in roentgenographic technique; (2) position of the stone; (3) size of the stone; and (4) character of the stone.

The localization of the stone was: ureteropelvic juncture, 26 cases; upper third, 28 cases; middle third, 1 case; lower third, 150 cases. The stone was impacted in the wall of the bladder in 20 cases. No doubt the number of operative cases will be reduced in the future as the result of recent improvement in operative cystoscopy. Stone was found in the left ureter in 134 cases and in the right ureter in 144 cases. Single stones were found in 261; multiple stones in 17 cases. Stones were found in both ureters in 6 cases, in the kidney on one side and the ureter on the other in 11 cases, making a total bilateral occurrence of 6 per cent.

There were 13 cases in which the stone was not found on exploration. In 3 cases the stone was pushed into the bladder, in 3 it was found to have been passed between the clinical examination and time of operation; in 4 cases the stone was passed after operation. In 5 cases no stone was found, which can be explained only as due to error in diagnosis. The importance is emphasized of having a roentgenographic examination made just prior to operation, if many days have elapsed since the cystoscopic examination. The history of a severe colic after the passage of a ureteral catheter should make one suspicious that the stone has been passed. A few cases were observed in which stones were passed after manipulation without a history of pain.

G. J. THOMAS.

Cabot, H.: Stone in the Kidney and Ureter; a Critical Review of 157 Cases. *J. Am. M. Ass.*, 1915, lxx, 1233.

The author presents a critical review of 157 cases occurring in the surgical service of the Massachusetts General Hospital during the seven years prior to January 1, 1914. As a result of this investigation he has deduced the following facts: that stone in the kidney too large to pass occurs most commonly between the ages of 10 and 40, and these

cases come to operation most commonly between the ages of 20 and 30. This observation carries with it the conclusions: (1) that the diagnosis of stone in the ureter is not made with great promptness, (2) that renal colic is absent in a considerable proportion of the cases, and the pain caused by renal calculus may closely simulate that caused by various other abdominal lesions and is frequently mistaken for such lesions; (3) that the urine is persistently normal in a proportion of cases sufficiently large to make it an uncertain guide; (4) that the roentgen ray is persistently negative in enough cases to make it dangerous to depend wholly on this evidence, but the combination of unusual pain symptoms, a negative roentgen ray, and a persistently normal urine is fortunately rare.

In this series there were 140 operations with 5 deaths, or 3+ per cent, which were distributed as follows:

Nephrectomy.....	2 deaths
Pyelotomy.....	1 death
Ureterotomy.....	1 death
Nephrotomy.....	1 death

Post-operative hæmorrhage of notable amount occurred in two cases, but did not prove fatal in either. The various operations done in these cases were as follows:

Nephrectomy.....	20
Pyelotomy.....	47
Ureterotomy.....	36
Nephrotomy.....	37

As the above figures will show, pyelotomy was the operation of choice. A considerable number of these patients had been subject to previous operations without relief for symptoms afterward proved to be due to stone in the kidney or ureter. The author calls attention to the fact that 85 patients were examined at the clinic more than two years after operation, this examination including a general physical examination, examination of the urine, and roentgen ray examination. Patients were classified as well who showed a normal urine and a negative roentgen ray. Patients were classified as not well when the urine showed pus, blood, or albumin and the roentgen ray showed a shadow, probably a stone. The result of this examination was as follows:

Of 64 patients operated on for stone in the kidney, 33, or 51 per cent, were well, and 31, or 49 per cent, were not well. Of 21 patients operated on for stone in the ureter, 15, or 71 per cent, were well, and 6, or 28 per cent, were not well. W. E. LOWER.

Smith, E. O.: Urinary Calculi. *Lancet-Clin.* 1915, cxiv, 172.

While urinary concretions have been found in the parenchyma of the kidney, this seldom occurs. A large percentage of calculi are formed in the pelvis of the kidney and either pass into the ureter or, remaining in the pelvis, gradually become larger. Most of those that enter the ureter pass into the

bladder. Women are the victims of renal calculi almost as frequently as men, but they seldom develop vesical calculi due to the mechanical arrangements of the urethra. Infection, foreign bodies, locomotor ataxia, and obstructions that interfere with the complete emptying of the bladder (prostatic enlargement and urethral stricture) predispose to the formation of stone in the bladder. The nucleus of a urinary calculus consists of colloids and crystalloids. Seldom is there a pure stone of any one mineral salt. No definite conclusions as to the chemical composition of a calculus can be drawn from its color, shape, or consistency.

The symptoms of a renal calculus may be located on one side while the pathology is in the opposite kidney. A unilateral renal or ureteral calculus may cause complete anuria. Calculi which are not too large are best removed by pyelotomy. It is not necessary to close the incision in the ureters with sutures. There is seldom leakage of urine. In doing a nephrotomy, if there is much infection, the author introduces a good sized drainage tube through the kidney into the pelvis, suturing the kidney snugly around the tube. After nephrectomy for stone there is a development of stone in the other kidney in about 10 per cent of cases. Recurrence after pyelotomy occurs in 51 per cent of cases and 56 per cent after nephrotomy according to Cabot.

The three favorite sites of lodgment of ureteral stones are: (1) where the pelvis joins the ureter, (2) at the pelvic brim, and (3) at the vesical wall.

Diagnosis of ureteral stone is made with the X-ray, the X-ray ureteral catheter, and the wax-tipped ureteral catheter. Geraghty in tabulating 67 cases of ureteral calculi, states that 15, or 22.4 per cent, were not detected even with repeated X-rays. Two of these stones were composed of calcium phosphate and carbonate and calcium oxalate without any uric acid. This seems to disprove the former theory that only uric acid stones escape the X-ray. A very large percentage of ureteral calculi pass spontaneously. Others can be dislodged by the ureteral catheter or are encouraged to pass by the injection into the ureter of warmed alcohol, olive oil, or glycerine. Dilatation or ligation of the ureteral orifice or burning with a fulguration wire may release intramural stones into the bladder. Surgical removal of these stones is not a simple procedure and should be resorted to only when manipulation has failed and there are present symptoms which make removal imperative, such as complete obstruction of the ureter or repeated attacks of colic.

More or less infection of the bladder is usually associated with vesical calculus. A great many of the bladder stones are composed of ammonium urate or phosphate, occasionally of oxalate. Positive diagnosis is made by metal sound, cystoscope, and X-ray. Shadows near the pubes suggest prostatic calculi, while the bladder calculi are usually higher. Very large and very hard stones and encysted calculi should be removed suprapubically. Calculi in

the prostatic urethra and medium-sized stones too hard to be crushed should be removed through a midline perineal incision. A great many vesical calculi can and should be treated by litholapaxy. The more proficient one becomes in the use of the lithotrite, the fewer will be the cases treated by lithotomy. Litholapaxy has the advantage of conserving the bladder and the patient is confined only a few days. Occasionally a calculus becomes lodged in the urethra anterior to the triangular ligament. Most of these calculi can be removed through the endoscope, but if this is impossible external urethrotomy is necessary. Specimens of calcareous material from the urinary tract should be carefully analyzed chemically. If found largely composed of calcium salts the patient is put on an acid treatment because the calcium is soluble in acids and if the urates predominate alkalies are given. It is not reasonable to suppose that enough acid or alkali can be given to dissolve a formed stone but enough may be given to act as a prophylactic measure. Since it is now known that nearly all renal calculi are composed of oxalate of lime, it would be more nearly correct to give all patients presenting renal calculi an acid treatment rather than alkaline as has been the almost universal practice in the past. C. R. O'CONNOR.

Braasch, W. F.: Significance of Vesical Symptoms in the Diagnosis of Renal Conditions. *St. Paul M. J.*, 1915, XVII, 720.

The relation of vesical symptoms to renal disease is much the same as that of gastric symptoms to disease in the gall-bladder, appendix, or duodenum. The underlying lesion in the kidney may have little or no localizing symptoms while the secondary vesical condition may give rise to all the subjective symptoms.

The renal conditions which are most frequently the cause of vesical symptoms are: (1) tuberculosis, (2) pyelonephritis, and (3) lithiasis.

1. Renal tuberculosis. Of 303 cases of renal tuberculosis reported by the author, 90 per cent had vesical symptoms extending over a period of six months, and over 50 per cent for more than a year. The remainder had vesical symptoms, the cause of which remained unrecognized in some instances as long as ten years. It would be conservative to regard all cases of persistent irritability of the bladder with pyuria, particularly in the young adult, as due to renal tuberculosis, until the contrary can be proved. As a rule, the vesical symptoms with renal tuberculosis are more severe in the male patient than in the female. A well advanced renal tuberculosis with comparatively slight irritability of the bladder occurs more frequently in the female than in the male.

2. Pyelonephritis. The cystitis accompanying diffuse infection of the renal parenchyma by organisms other than the tubercle bacillus is usually less severe than that occasioned by the tubercle bacillus. When the infection is unilateral and the urine from

the affected side is grossly purulent the two conditions may closely resemble each other. If guinea-pig inoculation is impracticable, error in diagnosis may easily occur. Localizing symptoms referred to the kidney occur even less frequently with pyelonephritis, than with renal tuberculosis, the irritability of the bladder alone calling attention to the presence of the pyelonephritis. Pyelonephritis as the cause of cystitis in the male was found in 109 of the 121 cases recently reported from the Mayo Clinic.

3. Lithiasis. At the time of the colic resulting from urinary obstruction by stone in the kidney or ureter, irritability of the bladder and frequency are often predominant symptoms and may be of importance in the differential diagnosis; in fact the absence of vesical irritability coincident with pain would be a factor in exclusion in the interpretation of a doubtful renal or ureteral shadow. The radiation of pain with renal lithiasis may be largely referred to the area of the bladder, especially in children.

Although a very large proportion of cases of cystitis are the result of renal infection, it should not be stated that cystitis may not exist as a primary and sole focus of infection in the urinary tract. Such cases are less common in the male without urinary obstruction, but are of frequent occurrence in the female.

Neurosis of the bladder usually occurs when other evidence of a neurosis is also present, and appears as part of a symptom-complex. These patients are too often subjected to needless operation.

The author feels that it is questionable whether displacement of the otherwise normal uterus can cause irritation of the bladder without a secondary complication.

H. W. FLAGGMEYER.

Welborn, J. Y.: An Interesting Kidney Case. *J. Indiana St. M. Ass.*, 1915, viii, 510.

Welborn reports the interesting case of a man of 30, who three weeks after nephrectomy for left-sided pyonephrotic stone-kidney developed uræmic coma. In spite of negative radiographic findings the right kidney was exposed and found apparently normal. On extension of the incision downward an impacted calculus was found in the right ureter about an inch and a half above the bladder. After removal of the stone, urination which had stopped for four days, set in at once. The entire operation was finished in twenty minutes. The patient made a speedy recovery and his urine became entirely normal.

M. KROTOSZYNER.

Rupert, R. R.: Further Study of Irregular Kidney Vessels as Found in One Hundred Eighteen Cadavers. *Surg., Gynec. & Obst.*, 1915, xxi, 471.

The author's study of this subject was begun in 1912 and the data accumulated was published in 1913. The additional data which has been gathered since that time is the basis for the following report.

The kidneys of 118 cadavers were studied; of these 103 were males and 15 females. The males included 98 whites and 5 negroes; the females included 13 whites and 2 negroes. This is worthy of note in that all the female cadavers showed some blood-vessel variation.

Cadavers showing variations were 57 males and 15 females; the males including 56 whites and 1 negro; the females, 13 whites and 2 negroes. Of the 118 cadavers, 72, or 61 per cent, showed a unilateral or bilateral variation of the artery or vein or of both.

The renal veins did not share the frequency of anomalous distribution with the arteries. With one exception, all cadavers showing variations in veins on one side only had this variation on the right side.

The axis type of bifid arteries corresponds to the "precocious division" of Gerard.

Two specimens show that one of the irregular arteries makes one complete twist around one of the branches of the renal vein or vice versa.

Seven specimens showed the same peculiar arrangement of the renal veins. Eleven specimens, including the seven above, showed variations in arteries or veins passing anterior to or posterior to the vena cava or aorta, when their normal position should have been opposite to the one occupied.

There were no movable, pelvic, or horseshoe kidneys found. There was one congenitally small kidney. There was one cadaver showing the congenital absence of the right kidney. This cadaver also had a unicornate uterus, the horn of the uterus being missing on the right side, the missing structures being represented by a retroperitoneal fibrous band about 1 cm. wide, extending from the region of the porta hepatis, the transverse fissure of the liver, to the region of the femoral ring on that side.

The kind and location of variations are as follows:

ARTERIES		VEINS	
Left side only	21	Left side only	6
Right side only	5	Right side only	30
Both sides	8	Both sides	0
VEINS AND ARTERIES IN SAME CADAVER		VEINS ONLY	
Left side	2	Left side	0
Right side	12	Right side	8
Both sides	2	Both sides	0

The vascular supply of the posterior portion of the primitive excretory apparatus in mammals is segmental. Many reptilia show multiple renal arteries; birds show four to six pairs of renal arteries and we should expect from ontogenetic and phylogenetic points of view to find much variation in the renal blood-vessels of man.

Kretschmer, H. L.: Supernumerary Kidney. *J. Am. M. Ass.*, 1915, lxxv, 1447.

The author bases his article upon a report of a case of this rare anomaly, and includes a review of 15 cases. In Kretschmer's case, two of the three kidneys contained calculi. A nephrectomy was performed in which two of the three kidneys were removed. The patient made an uneventful recovery.

A cystoscopic examination made subsequent to the operation revealed but two ureteral orifices, normally situated. The supernumerary kidney had its own blood supply and its own ureter, which fused with the ureter of the large kidney, outside of the bladder.

The author lays stress upon the value and necessity of differentiating cases of true supernumerary kidney from cases of double or fused kidney.

The author's case was the only one that he was able to find in the literature in which two of the three kidneys contained calculi.

Lichtenstern, R.: Injuries of the Kidney in War (Kriegsverletzungen der Niere). Wien Klin. Wochenschr., 1915, xxxvii, 1129.

Gunshot injuries of the kidney are relatively rare, partly because the position of the kidney protects it from abdominal injuries, partly because when the injuries are severe enough to involve it the patients die on the field. Lichtenstern, however, has had 21 cases of injury of the kidney; 5 of bullets passing through the kidney, 4 of gunshot injury with other complications, 1 of stab wound, and others from violence, such as falls, kicks, etc. Four were operated upon; the rest recovered under conservative treatment with one exception. There was only one death. The details of the case histories are given.

Injury of the kidney is generally recognized by hematuria and local pain. There is apt to be enlargement of the kidney from subcapsular hematoma; if so it can be recognized by careful palpation; great caution should be exercised in palpation to avoid further hemorrhage. If there is urine infiltration the infiltration can be felt in the kidney region. If there is extensive hemorrhage into the bed of the kidney the organ may be pushed up against the diaphragm, in which case it cannot be differentiated from the hematoma. If there is any question of removing the kidney, cystoscopy and catheterization of the ureters must be performed to be sure that the other kidney is intact.

The severest complication of kidney injury is urine infiltration, which is relatively rare. It occurred three times in the author's 21 cases. The prognosis depends on the extent of the injury, complications in other organs, and secondary infection. In general it is good.

When the bullet simply passes through the kidney and there is no great amount of hemorrhage, conservative treatment is indicated; the patient should be put at rest, the wound cared for aseptically and cold applications used; the diet should be milk and cold fluids; horse serum is an excellent hemostatic. If there is severe hemorrhage operation is indicated. Tears in the perinephyma may be sutured; and if the pedicle is injured the vessels should be sutured. If the organ is too severely injured to be sutured or there is danger of infection, nephrectomy is the operation of choice. In either suture or nephrectomy the wound should be drained. The

treatment in urine infiltration is necessarily operative. The infiltrated region should be opened up and thoroughly drained.

A. Goss.

Squier, J. B.: Renal Pain: Diagnostic and Clinical Significance. Internat. J. Surg., 1915, xxxv, 254.

Kidney pain is divided into two groups: (1) true renal pain, located in the lumbar region, of dull aching quality, constant in character; (2) pelvic or ureteral pain, radiating from the lumbar region to the scrotum, of paroxysmal or intermittent character.

Pain with pus, but without cystitis, suggests the calculous group; pain with pus, with cystitis, suggests the tuberculous group; pain without pus, without cystitis, plus tumor, suggests the hydronephrotic group. Renal pain never becomes paroxysmal, but is always constant.

In pelvic and high ureteral involvement, the skin of the scrotum is not painful on pressure, but the deep tissues are. In lower ureteral and adjacent regions, the superficial tissues are painful, with absence of pain in the deeper tissues.

Distention of the renal pelvis and upper third of the ureter is associated with urinary frequency, but usually without painful micturition. HARRY KRAUS.

Cole, H. P.: Nephrectomy Under Local Anesthesia; Adenoma of the Kidney. Urol. & Cutan. Rev., 1915, xix, 545.

The author describes nephrectomy for adenoma of the kidney performed under local anesthesia. Scopolamine and morphine were given one hour and fifteen minutes before operation. Paravertebral conduction anesthesia was produced after the method of Kappis, infiltrating the intercostal regions from the eighth dorsal to the first lumbar. Five ccm. of a 2 per cent novocaine-adrenalin solution was used to infiltrate the skin and subcutaneous tissue along the line of incision. The kidney was easily delivered, the patient complaining of slight discomfort when the kidney pedicle was ligated.

B. S. HARRINGTON.

Luxembourg, H.: Decapsulation of the Kidney in Bichloride Poisoning (Zur Frage der Nierenkapselung bei Sublimatvergiftung). Deutsche Zeits. f. Chir., 1915, cxxxiv, 377.

Luxembourg reports four cases of severe bichloride poisoning which were treated by Bardenheuer by kidney decapsulation. In these cases there were all the characteristic symptoms from simple stomatitis with extensive saliva to severe uncontrollable vomiting, bloody diarrhea, and partial or complete anuria, which was manifested by all the patients. The most interesting case was that of a druggist who was fully acquainted with the toxic effects of bichloride and who took 50 ccm. of bichloride in 100 ccm. water. After 8 days he showed, as a sign of severe intoxication, a marked exanthema of the whole body, resembling a syphilitic rash.

Operation was performed on the ninth day, and

as the patient had complained of pain in the left kidney region, the left kidney was exposed through a Simon lumbar incision. It was enlarged to almost double its normal size, was dark bluish red in color, and very brittle, so that in loosening the capsule shallow tears were made. The capsule was stripped off to the hilus, the wound filled with gauze, and sewed up, except that an opening was left for the gauze. Recovery was uneventful.

On the first day after the operation 1,100 ccm. of urine was discharged. It contained albumin and many casts but was free of blood. His sight, which had been very much affected, improved. On the second day there was 1,800 ccm. of urine, and on the third 4,000, which was almost free from albumin. The exanthema disappeared 12 days after the operation, though there was found to be a large chancre of the frænulum and glands. The patient recovered completely. The other three patients died, though two of them showed great improvement in urine excretion after the operation.

Before Bardenheuer, Kuemmell was the only man to undertake kidney decapsulation for a nephritis caused by chemical poisoning. He succeeded in bringing about abundant excretion of urine after four days anuria, but could not prevent the fatal termination. The course was similar in three cases operated on by Tisserand-Besancon for anuria after mercury poisoning, and of which Luxembourg gives brief case histories.

A. Goss.

Loux, H. R.: Plastic Surgery of the Kidney Pelvis and the Ureters. *J. Am. M. Ass.*, 1915, lxx, 1237.

The author comments on the lack of attention that has been given plastic surgery of the kidney pelvis and ureters, as evidenced by the fact that only 151 cases are reported up to June, 1911. He briefly reviews the 70 cases which he has been able to collect since that date and includes in this review the several operations and the technique as developed in the surgical treatment of these cases. The article is concluded with the reports of 3 cases from the author's own experience.

He states that although the function of a hydro-nephrotic kidney is impaired the organ is not useless. The kidney probably does not regain its normal function after the obstruction is removed.

The paper contains many abstracts of reports by foreign and American surgeons of plastic operations done upon the kidney pelvis and ureter. A number of different types of operations are reported for the relief of ureteral fistulae, with much divergence of opinion as to their efficiency. He thinks that the intraperitoneal transplantation of the proximal end of the ureter into the bladder seems to be the procedure of choice. This he thinks is especially true of fresh lesions not too remote from the bladder and for fistulae when the corresponding kidney and the bladder are normal. In his opinion, suturing the ureter does well in small lesions, but does not do well in extensive lesions, since the sutured ureter always shows a tendency to stenosis. He states that

nephrectomy has never disappeared from the operative repertory for ureteral fistulae. The general opinion today is that it is best not to interfere with the kidney as long as it does no harm or so long as the urinary tract is healthy. Implantation in the abdominal wall produces ureteral abdominal fistula. The danger of ascending infection is one of the great disadvantages in these operations.

Loux states that other observers have reported brilliant results with simple ligation of the proximal end of the ureter. Experimental studies have shown that the ligatures develop a pronounced tendency to fistulous formation by the wearing away of the ureteral wall. He thinks that the care of the ureters presents many difficulties and that the ideal method has not been devised. Investigators are busily engaged in experimental studies along this line.

The author reports the following cases:

The first, a female, aged 27, had no previous history with the exception of an attack of pneumonia. The present trouble dated back two years and consisted of a sudden onset of pain in the right lumbar region with radiation into the right labium. She had several such attacks, some of them very violent. During one of the late seizures the pain-radiation seemed to be in the left thigh. During the attack the urine was decreased and was followed by an increased flow. The attacks lasted several hours, followed by nausea, vomiting, and exhaustion. The left kidney was not palpable. A smooth mass moving with respiration was palpable in the right hypochondrium, the mass being very tender. Cystoscopy and pyelography disclosed a displaced right kidney with a small stone in the kidney pelvis. The ureter was kinked and the kidney hydro-nephrotic. No shadow of the injected fluid was suggested. At operation the right ureter was distended and kinked, the elbows of the kinks being adherent. The renal pelvis was much distended and the second ureter was found and traced to the upper portion of a dilated pelvis. Pelvic lithotomy was done and a resection of a portion of the renal pelvis was made. Nephropexy was then done. The patient made an uneventful recovery and was discharged five weeks after the operation and was apparently well eleven months afterward.

The second, a male, aged 32, had a history dating back eighteen months when he began to have attacks of left renal colic. These increased in severity and frequency. Repeated roentgenograms were negative. Ureteral catheterization showed obstruction to the catheter on the left side 10 cm. from the orifice. The stricture was treated for a month by gradual dilatation, which seemed to give relief. During the next month the patient had recurrence of his pain and returned for further treatment. Exploration was advised and a narrowing of the ureter was found at the point mentioned above. The ureter was dilated above the point of obstruction and a small stone was detected on palpation and removed through a small longitudinal incision.

This incision was continued for about 1.5 cm. so that the structure was freely divided. A transverse line of two-tier sutures was inserted, thus increasing the constricted lumen beyond that of a normal ureter. No leakage occurred and the patient had an uneventful recovery.

The third, a male, aged 33, gave a history of four severe attacks of right renal colic preceding the present history. Palpation revealed a painful mass in the right loin. Urinalysis showed pus and blood. Roentgenograms demonstrated a shadow over the right renal area. The patient was profoundly toxic. At operation pyonephrosis and stone of the right kidney were found. Because of the grave condition of the patient, drainage was thought best as a preliminary step to a nephrectomy. It was found convenient at this time to bring the ureter into the loin where it was fixed in position. This was done with a view to expediting the second operation. The patient was discharged the thirty-third day after admission. Nearly twelve years have elapsed since the ureteral transplantation and the patient has enjoyed the best of health. He does not experience much inconvenience from the urinary drain and does not want a second operation. G. J. THOMAS.

Ward, G. G., Jr.: Post-Operative Renal Infection. *Surg., Gynec. & Obst.*, 1915, xli, 490.

The author believes that many instances of obscure and apparently unaccountable elevations in temperature, with concomitant symptoms of septic absorption occurring late in the course of a post-operative convalescence, are cases of renal infection, and that they are much more frequent than was formerly believed. In the majority of cases these renal infections are due to the colon bacillus.

The reports of cases of this disease show the frequency with which it follows some operative procedure. This is not strange when the probable causative factors and the mode of infection are remembered. The preponderance of evidence—the result of both clinical and experimental research—tends to prove that the large majority of such renal infections are hematogenous in origin, although some cases may be caused by an ascending infection either by way of the perireteral lymphatics, or by extension up the lumen of the ureter.

The indications for the treatment of the severe types of this disease are by no means well defined. Neither is the question settled as to whether this type of kidney infection is characterized by being unilateral, as claimed by Brewer. There would seem to be no reason why the infection might not attack both kidneys simultaneously in certain instances, or first one organ and then the other. Thus it might be possible to account for the variations in the results of nephrectomy and nephrotomy, or decapsulation. As Kelly and Burnham state, the subject deserves more study and careful recording of cases.

Whenever an infection follows an operation, be it ever so mild or insignificant (as for instance, a small

stitch abscess in the skin incision), should one or both kidneys happen to be damaged by previous disease such as might be caused by a calculus or some form of nephritis or by anything that produces congestion and prevents free drainage of the organ, as excessive mobility, the kidney may become infected on account of its lowered resistance from the bacteria which are being filtered through it, with the resulting formation of multiple septic infarcts.

There are three types of the infection, depending upon the degree of virulence, and the virulence naturally varies according to the particular organism, the condition of the kidney, and the general bodily resistance of the patient. The types are:

1. Cases which are mild in character, the patient not being severely ill, and which yield to the thorough flushing of the kidneys by the ingestion of water, formaldehyde, proper diet, and rest.

2. Cases in which the kidneys contain numerous septic infarcts, and minute or microscopic pus foci, which are superficially situated in the cortex of the organ. Decapsulation or incision with drainage usually results in recovery.

3. The fulminating type, which is characterized by a profound toxæmia, and which is rapidly fatal unless a nephrectomy is done. Fortunately this type of the disease is usually unilateral.

Irritability of the bladder as manifested by frequency of micturition and dysuria is often an early sign of the onset of the disease, and Ward believes that many cases in which the nurse has been held responsible for a supposed cystitis, due to carelessness in using the catheter, are really due to a renal infection of hematogenous origin.

To decide correctly when to operate and when not to operate calls for the exercise of great care and thoroughness in considering all the factors and sound judgment in weighing their relative values. The general principle governing the line of treatment should be that of conservatism coupled with a sharp watchfulness for signs and symptoms indicating that the point of toleration to toxic absorption has been reached by the patient, the result of lowered resistance caused by the progress of the disease.

If operation is necessary, nephrectomy should not be done unless the indications for it, as shown by the appearance of the kidney, are positive. A decapsulation or nephrotomy with drainage is sufficient in many cases, as shown by numerous reports, especially in the colon bacillus infections.

Three cases are reported illustrative of post-operative renal infection.

In conclusion Ward calls attention to the following points:

1. That post-operative renal infection is more frequent than has been formerly appreciated, owing to the fact that in many cases it is overlooked on account of the mild character of the infection, the severe types being comparatively rare.

2. That vesical irritability occurring after operation may be an important precursory sign of renal

infection, and therefore should not necessarily be attributed to a cystitis caused by carelessness.

3. That a study of the urine will show the probable type of the disease present, and thus be a guide to the treatment.

4. That a careful study of the pathological condition of the kidney should be made at the operation in order that nephrectomy may be avoided if possible.

Boyd, M. L.: Gonorrhœal Ureteropyelitis; Report of Two Cases Treated by Injections of Anti-meningitic Serum. *Surg., Gynec. & Obst.*, 1915, xxi, 536.

The author reports both cases cured. Other treatments were employed only to the slightest extent during the time of the injections of the serum. The first case also had an infection of the sacro-iliac joint as a complication of the gonorrhœa; this disappeared along with the ureteropyelitis. Lavage of the kidney pelvis with solutions of silver nitrate was tried in the first case without apparent benefit. The second case had a 19 F. stricture of the pendulous urethra, and also a urinary infection with a gram positive diplococcus, which disappeared only after the cure of the gonorrhœal infection, when the dilatation of the stricture was begun and doses of hexamethylenamine were given. The highest temperatures reached after the injections of the serum were 103° in the one case and 101.5° in the other. Doses varied in size from 4 to 15 ccm., the initial dose being small. The author takes this opportunity of pointing out the accessibility of the sacro-iliac joint to examination by the finger introduced into the rectum.

Barber, W. H.: Uretero-Enteric Anastomosis; a Further Experimental Study. *J. Am. M. Ass.*, 1915, lxxv, 1243.

Barber reviews the work and aims of various men who have striven to dispose of the ureter separated from the bladder. He pertinently quotes Matas who writes of the responsibility for such work — the operator has burned his ships behind him. He stakes all the patient's chances on the one hazard and this consideration makes it a perilous undertaking.

Draper and Braasch have determined that destruction of the ureterovesical valves is not inevitably followed by renal infection.

Barber emphasizes again the importance of the peristaltic factor, being inclined to lay greater stress on this than on the integrity of the valves. The divided ureters are drawn by attached sutures obliquely through the wall of the gut, a distance of 1.5 to 2.0 cm., with the colon held on the stretch, then out directly, the ends being secured to the skin. One of the distended ureteral ends is then partly divided. It was found that:

1. Plus physiologic caudad ureteral resistance is manifested first by dilatation of the cephalad end of the ureter.

2. Continued incomplete ureteral obstruction leads to a dilatation of the second and third portions of the ureter and a dilatation of the renal pelvis.

3. Time spent in elaborating the terminal relations of the ureters is therefore valueless.

4. Oblique entrance is conducive to less local inflammatory reaction and, referring back to a former paragraph, to less obstructive symptoms than by directly carrying through the gut wall.

FRED R. CHARLSON.

Bissell, D.: The Surgical Treatment of the Tubercular Ureter in the Female. *Surg., Gynec. & Obst.*, 1915, xxi, 615.

When performing nephrectomy for tuberculosis of the kidney, consideration of the disposition of the tuberculous ureter is of almost equal importance with that of the kidney itself.

Two illustrative cases are cited showing that when the tubercular kidney alone is removed the success of the operation is often jeopardized; Rovsing, Kapshammer, and others are quoted in support of this view.

When it has been determined that the ureter with the kidney should be removed, the adoption of the combined transperitoneal and retroperitoneal route is preferable to the retroperitoneal alone.

The advantages of the median transperitoneal route for ligating, severing, and freeing the ureter from its attachments are applicable to both the male and female. These advantages are, however, greater in the female than in the male, which fact is readily appreciated when the anatomical relationship of the pelvic organs in the sexes is compared.

In the female the ureter passes along the base of the broad ligament and under the uterine artery before it reaches the bladder, making the uterine adnexa play an important part in the problem of surgical approach to the ureter. Because of this relationship the complete removal of the pelvic portion of the ureter in the female by any of the retroperitoneal methods is difficult and may prove dangerous. With an extended lumbar incision, there is necessitated an extensive surgical invasion of tissue, tissue filled with important nerves and blood-vessels, which when injured often result in great discomfort and even permanent distress to the patient.

Pelvic complications in the female, adnexal and uterine, are not uncommon. The median transperitoneal route permits of direct approach and unrestricted access to the entire pelvic region. Retroperitoneal surgery of the ureter in the female should be condemned as it is at best blind surgery and does not afford the safeguards at our command.

The operation is done by the transperitoneal route, a median incision being made below the umbilicus. To secure a field for exact surgical manipulation, a temporary suture is passed through the posterior uterine wall near the junction of the corpus and cervix. When traction is made upon

this suture the entire cervical region of the pelvis is brought within easy reach of the operator, and the corpus removed from the field of vision. A second temporary suture is passed through the ovary of the side affected and through the outer portion of the round ligament. When this suture is tied, the adnexa also are removed from the field of vision. The pelvic peritoneum is then incised along the outer border of the ureter, and through this incision the ureter with its fascial sheath is dissected from its cellular bed and tied at its distal end under the uterine artery. The freed ureter is then placed in the retroperitoneal space behind the caecum, the pelvic peritoneal incision sutured, and the abdominal wound closed. The patient is then turned upon her stomach and the kidney with its freed ureter removed through a limited lumbar incision.

The resulting shock from the combined routes has been inconsiderable. The surgical and symptomatic results have been ideal.

BLADDER, URETHRA, AND PENIS

Mertz, H. O.: Vesical Calculi in Children. *J. Indiana St. M. Ass.*, 1913, viii, 396.

Mertz reports a case of a large calculus, 1.5 cm. in diameter, in the bladder of a girl of five years, which was removed by litholapaxy in two sittings.

The author gives 12 reasons in favor of litholapaxy against suprapubic lithotomy for vesical lithiasis in children. The most important advantages of the crushing operation are: it is well borne by children; it does no lasting injury to the parts; it is quickly recovered from; and it has a remarkably low mortality.

M. KROGIZNEK.

Leguen, F.: Two Cases of Foreign Body in the Bladder (Deux observations de corps étrangers de la vessie). *Bull. et mém. Soc. de chir. de Par.*, 1913, vi, 3175.

Leguen reports two cases of foreign body in the bladder observed by Fabry, and discusses the question in general. He has had to such cases. The bodies are generally removed through a hypogastric incision. The chief point of interest is in the localization of the projectiles. It is very easy to be mistaken in the position of a foreign body in the pelvis seen in a radiograph.

The case is cited of an officer who had been advised against the extraction of a projectile in the pelvis. By cystoscopy it was found in the bladder and was removed through the urethra very quickly. In another case the radiograph showed the bullet in the posterior end of the sac; operation failed to find it there. A few days later the author did a cystoscopy and found it in the bladder. Therefore in such cases two radiographs should always be taken, one on the back and the other in the abdominal position, or one with the bladder full and the other with it empty. If the bullet is in the bladder there will be a considerable difference in its position in the

two pictures; if it is located elsewhere it will not change position. Two such radiographs, supplemented by cystoscopy, will prevent errors in localization.

In the discussion Quénu and Michon each described a case in which they had made a mistake in localization, and commended Leguen's suggestion of taking two roentgen pictures.

A. Goss.

Laverrière, M.: Proliferating Tuberculous Cystitis. *N. Y. M. J.*, 1913, vii, 1644.

The author has reported three tubercular kidney cases in which the bladder findings were interesting. Pain and pollakiuria were present. The increase of the functional symptoms are important. Frequency is always present. The terminal cystalgia in proliferating tuberculous cystitis is slight, because ulceration does not exist. The bladder capacity is usually fairly good, the urine containing a considerable amount of pus which comes from the diseased kidney.

The cystoscopic picture usually shows rounded granulations between the ureteral orifices, and usually surrounding the orifice of the diseased kidney. The epithelial coverings are intact over the granulations, which vary in size. In the three cases reported, urethral catheterization showed the diseased side. Following nephrectomies, the bladder pictures showed a gradual clearing up of the granulations.

C. D. PICKRELL.

Gardner, J. A.: Operative Treatment of Tumors of the Bladder. *Ann. Surg. Phila.*, 1913, lvi, 435.

The 369 tumors of the bladder reported by the author refer to those primarily in the bladder and not malignancies which have invaded the bladder secondarily from other organs. In this series the tumors have been classified as follows: carcinoma, 178; papillomata, 175; sarcoma, 7; CYST, 4; polyps, 3; fibroma, 1; cystitis cystica, 1. As would be expected, the great majority were carcinoma and papilloma. Tumors were present four times as frequently in the male as in the female. The average age at which they were found was about 50 years, the average being 47.3 for the papilloma and 34 years for the carcinoma.

Of the 7 cases of sarcoma in this series 2 occurred at 5 and 6.5 years, respectively, the remaining 5 between the ages of 30 and 73. The results of operation in these cases were unsatisfactory, death occurring soon after operation except in one case, in which the patient lived four years.

The statistics regarding radium are too meager to justify drawing any conclusions, it having been used in 6 cases only and with little success except in one.

Included in this series are 4 total cystectomies and one preliminary transplanting of the ureters into the loin as a primary step. In 4 of these cases the ureters were transplanted into the loin and in one into the sigmoid. Of the 5, 3 died as a result of the operation, one after preliminary trans-

plantation of the ureters into the loin, from hypostatic pneumonia and renal insufficiency; another who had implantation into the loin died of shock; and the third patient, in whom the ureters were transplanted into the sigmoid, also died of shock. Unfortunately total cystectomy seems to be reserved as a last resort and the mortality from the operation in patients *in extremis* is of course very high. In cases where this operation is indicated and patients operated upon earlier, it would seem that Watson's two-step operation of first implanting the ureters into the loin will give more satisfactory results.

Percy advocates the heat treatment for carcinoma of the bladder, using the same technique he uses for malignancies in the abdominal cavity. Few cases have been reported, however, and sufficient time has not elapsed to allow us to judge whether this method is more advantageous than excision of the growth by actual cautery, which has not proved a marked success.

Primarily the papillomata may be benign, but potentially are malignant and will become so if the patient lives long enough. Pathologists report cases in which one part is benign and another part is found to be malignant. They also state that a negative report as to cancer means no more than a negative report on sputum examination for tubercle bacilli. In the face of this difficulty, which method of operation will show the least recurrence?

In the treatment of papilloma Beer's method of using the high-frequency current has been received as a marked step in advance. High-frequency has many advantages because of its simplicity and because it obviates hospital care and confinement. The operative mortality is practically nil. In this series it amounts to 0.7 per cent, which is created by one case occurring in the author's practice. Beer emphasizes the importance of selection of cases because he states that he does not believe malignant neoplasms can be cured by the intravesical high-frequency current. This conclusion has been borne out by Keyes and other urologists of large experience.

Gardner's conclusions are as follows:

1. In the treatment of carcinoma the transperitoneal method as used in the Mayo clinic or the subtotal cystectomy of Squier, with wide resection of the bladder wall, offers the best method. These methods give the operator opportunity to look for enlarged glands or metastases and if necessary the ureters can be easily transplanted.

2. Cystotomy and excision and the actual cautery should only be used in terminal cases as a palliative method to relieve pain and hæmorrhage.

3. When the growth involves both ureters Watson's operation of total cystectomy with a primary operation for transplanting the ureters into the loin shows the best results.

4. In the treatment of papilloma, intravesical high-frequency current during the short time it has

been used has given better results than any other method, reserving the question for time and statistics to determine whether this method by reason of the difficulty in distinguishing between papilloma and carcinoma is shown to be as satisfactory as wide resection, such as is advised for carcinoma.

J. DELLINGER BARNEY.

Jones, F. W.: The Explanation of a Recto-Urethral Anomaly, and Some Points in Normal Anatomy. *Lancet*, Lond., 1915, clccclx, 86a.

Jones discusses the anatomy of the recto-urethral fistula from the standpoint of comparative anatomy and shows that it is the development of the copulatory organs within the ectoderm in which the variations producing these fistulae occur.

The development of the genital organs of the tortoise, known as *testudo elephantina*, is discussed in detail. The author says "The copulatory organ of this giant tortoise is composed of bilateral erectile thickenings of the ventral cloacal wall (corpora cavernosa); upon their free (dorsal) aspect are developed outstanding folds—seminal guides—having in their attached margins other erectile masses (corpora spongiosa). Between these two seminal guides runs a median groove—the seminal groove—converted into a closed seminal canal only during functional activity by the erection and meeting of the seminal guides."

Jones continues to draw the analogy between the animal and the human embryo and traces the development of the free edges forming the median raphe and says that in the male the seminal guides extend from the base of the glands at the site of the frænulum and pass backwards into the anal margin. This median raphe is not so marked in the female as in the male.

He says that in the normal male the seminal guides meet and fuse in the midline; the erectile masses by their midline union complete the penile urethra or seminal canal; the coalesced free folds constitute the median raphe. In the anomaly we are considering these masculine folds are possibly more than usually well developed, and the fusion not only affects that portion forming the normal median raphe, but also that part which runs around the anal margin. The anus is thereby closed in and embraced in the raphe (just as it would be if the seminal guides of the male tortoise were to coalesce), and the anal orifice is carried forward in the raphe to its termination in the frænulum. It may fall short of the frænulum, and fistulous openings may be present anywhere in the normal extent of the raphe.

Another anomalous condition may arise obviously as a modification of the process described. The median raphe may be formed right across the anal membrane and the membrane may subsequently perforate upon both sides of the raphe, leaving it as a median band stretching across the anal orifice; this malformation is a well known one.

A. C. STOKES.

Pelouse, F. S.: New-Growths of the Prostatic Urethra in Relation to Tuberculosis. *N. Y. M. J.*, 1915, 10, 792.

The author has observed growths of the posterior urethra occurring in cases of genito-urinary tuberculosis. He believes that the presence of these growths are in themselves sufficient warrant for a probable, if not a positive, diagnosis of genito-urinary tuberculosis. The growths are found only in the prostatic urethra, confined almost entirely to the roof and lateral walls, being most numerous just external to the vesical sphincter. They range from about one-twelfth to one-quarter the size of the normal verumontanum; they are paler than the mucous membrane from which they spring, which is usually healthy in appearance; generally in clusters, sometimes isolated; either pedunculated or sessile, are not watery and translucent as bullous urethra or benign papillomata, and tiny blood-vessels can be seen in their smooth surfaces. Sometimes the growths are solid, and sometimes appear to have undergone cystic change.

In most of the patients examined tubercle bacilli were found in the urine; in several patients these growths were removed from the posterior urethra, and tubercle bacilli were found in the growths. In most of the cases cited the diagnosis of tuberculosis was made from staining, and not from guinea-pig inoculation. The author thinks the former is sufficient for a diagnosis, and that the latter may fail. He cites the work of Webb, who inoculated guinea pigs with small numbers of tubercle bacilli without producing any disease. B. S. BARRINGER.

Day, R. V.: Destroying Limited Obstructive Glandular Growths in the Posterior Urethra by the High-frequency Current. *J. Am. M. Ass.*, 1915, 10, 1777.

Day uses the two bipolar high-frequency current, which for urethral work he finds much superior to the unipolar current because it shortens the spark gap and the danger of ground shock is practically eliminated. Also because the action is much more rapid and extensive and danger from secondary hemorrhage is less. In his report of eight cases for urethral growths the results were uniformly good. J. S. EISENSTADT.

Weitz, H.: Treatment of Hypospadias (Zur Hypospadiasbehandlung). *Deutsche med. Wochenschr.*, 1915, 10, 1524.

Many methods of operation have been devised for the relief of hypospadias. Weitz gives the case histories of two patients that were operated on by the method proposed by Streissler and Lexer, in which they transplant the vermiform appendix to reconstruct the urethra. Streissler and Lexer conceived the idea of this transplantation independently of one another. The method is as follows:

The patient's appendix is removed, and the sero-muscular coat removed from the cylinder of mucous membrane, the mucous membrane cylinder is

irrigated with weak hydrogen peroxide solution, and kept in warm physiological salt solution. A longitudinal incision is made at the apex of the glands and somewhat back and to one side of the urethral orifice. A trocar is passed through from one incision to the other, care being taken to avoid the corpora cavernosa, which might cause severe hemorrhage. The appendix is then drawn through the trocar and its ends sutured to the skin. After four weeks the appendix is united to the urethra, after the formation of a perineal fistula. Then the urethra is dissected free, freshened and sutured over a Nelaton catheter.

In all three of Streissler's cases the appendix took without reaction, but a small fistula remained. Weitz found that it was only necessary to remove the serosa of the appendix and the muscular and mucous coats could be used. A small fistula remains, but if it does not close after one or two months spontaneously it can be closed by a supplementary operation. The results were good in both of his cases. A. Goss.

Gelpi, P. J.: An Unusual Injury of the Penis with Successful Repair. *N. Orl. M. & S. J.*, 1915, lxxviii, 264.

On December 28, 1914, a colored boy, aged 9, was admitted to the hospital, presenting a condition of unusual interest. His penis, at a point about half an inch in front of the pubis, was almost completely severed, just as though it had been done by a knife in a circular amputation of the organ. The skin was cut through all around, the cavernous bodies were almost completely divided, and below the spongy body including the urethra was severed. The dorsal vessels and those of the spongy body, as well as the central arteries of the cavernous bodies, were cut, and it looked as though the distal portion was hanging by a mere thread. The uncut segment of the penis measured less than three-eighths of an inch across and less than a quarter of an inch in thickness. Edema of the pendulous part with phimosis was present to a marked degree, denoting to what extent the circulation was impaired. It was thought at first that it would be a useless task to attempt restoration, in view of the great impairment to the circulation. The impression among those who viewed the case was that nothing short of completing the amputation would avail. It was decided, however, to try repair by gradual stages.

The operative procedure was as follows: On December 29 a dorsal slit was made to release edema of the prepuce. This was done under local analgesia—novocaine. On January 2 a partial penorrhaphy was done under local anesthesia. Three catgut sutures passing through the skin and deeply through the cavernous bodies were placed so as to unite the dorsum. The result was fairly good and lent encouragement to proceed with the work. January 19, circumcision and urethrorrhaphy were done, and the penorrhaphy completed. February 5, external urethrotomy and urethrorrhaphy were

done under ether anesthesia. February 24, internal urethrotomy and urethrorrhaphy were completed under general anesthetic.

This case demonstrates what perseverance will accomplish in plastic work. It also shows how parts can be restored even when the circulation has been impaired almost beyond hope.

H. A. MOORE.

GENITAL ORGANS

Walther, H. W. E.: Treatment of Acute Epididymitis by Aspiratory Puncture. *Med. Rec.*, 1915, lxxxviii, 567.

Walther lays great emphasis on the importance of speedily terminating any acute infective process in the epididymis. This rationale should be apparent because of the liability of permanent secondary changes that at times ensue from such inflammation, these changes affecting the functional (procreative) power of the testis, at times destroying it.

Today, when surgery is attempting to progress along conservative paths, Walther does not deem it rational to perform any open operation, as epididymotomy or epididymovasotomy, when simpler means are at our disposal which are just as efficient.

The method he describes for treating acute epididymitis is that of aspiratory puncture with a hypodermic syringe as first practiced successfully by Baermann and later popularized by Ernst.

The technique adopted by the author has been as follows:

The scrotum is prepared aseptically as for any operation; the practice being to shave the skin, thoroughly cleanse the same with green soap and sterile water, and then paint the site of puncture with tincture of iodine. The affected testis is then firmly grasped with one hand, the epididymis to be punctured pointing uppermost, and the skin over the selected area of entrance of the needle is put on tension. A very sharp-pointed, fairly large needle which is connected to a 10-ccm. record syringe, and which has been previously sterilized, is then thrust through the skin of the scrotum into the substance of the epididymis for one-half to two-thirds of an inch, and then the attempt is made to aspirate gently some of the seropurulent content. By withdrawing the needle slowly, aspirating all the while, one will often succeed in obtaining fluid from the different levels in the gland, when the same would not have been secured if the needle were held in only one plane. Usually two or three punctures are made at different points in the affected organ.

The wounds are then sealed with a collodion dress-

ing and a suspensory applied to the scrotum. Confinement to bed is not necessary and the after-care of these cases is very simple.

The only anesthesia employed has been that of spraying locally the site of the puncture with ethyl chloride to freeze the part. In hospital practice even this spray has not been found necessary to gain the patient's consent to have the punctures made. General anesthesia is never necessary. With hypersensitive patients one might inject a few cubic centimeters of two per cent novocaine solution subcutaneously and down to the epididymis so as to diminish the sensation when needle puncture is made.

As a rule little fluid is withdrawn. The effect of the aspiration, however, becomes manifest by almost immediate relief from pain, and within six to twelve hours the swelling in the gland and the fever will be noticed to have diminished considerably.

The procedure is a painful one, at times very painful, but the aspiratory puncture causes a cessation of the patient's sufferings so promptly, shortens the duration of the infection so markedly, and as it preserves the functional (procreative) power of the testis as successfully as any of the more formidable operations advanced, Walther believes that this method of treating acute epididymitis is deserving of more attention and favorable consideration than has been accorded it in the past.

Koll, I. S.: Primary Tuberculosis of the Prostate Gland. *Ann. Surg.*, Phila., 1915, lxi, 473.

A careful search of the literature shows but two probable cases of primary tuberculosis of the prostate reported.

The author's case, aged 61, entered the genito-urinary service of the Michael Reese Hospital, giving the typical symptoms of prostatic obstruction. Per rectum, the prostate felt about three times its normal size, consistency firm, surface smooth, except for two or three small nodules, which did not seem unusual. Cystoscopic examination revealed nothing except a low grade of cystitis. The median lobe protruded considerably into the bladder.

The patient was in the hospital five months, on account of a persistent fistula, which was uninfluenced by gradually increasing doses of tuberculin, subcutaneously. This treatment was begun as soon as tuberculosis was reported by the pathologist. It is of interest to note that there was not the slightest reaction to the tuberculin, even in one milligram doses. This is strongly suggestive that there was no other active tuberculous focus in the body.

SURGERY OF THE EYE AND EAR

EYE

Rollet, E., and Mangini, L.: Lesions of the Deep Membranes of the Eye in War with the Eyeball Intact (*Lésions des membranes profondes de l'œil par blessures de guerre avec intégrité du globe*). *Lyon Méd.*, 1915, xii, 397.

Lesions of the eye have increased greatly since the armies have been entrenched. In August, 1914, one of the authors estimated that eye wounds constituted 1 per cent of all injuries, while in January, 1915, they constituted 14 per cent. There is a considerable group of cases in which, though the eyeball is intact, the retina or choroid or both are injured. The authors have collected 96 such cases and give colored plates showing the ophthalmoscopic pictures in 14.

In some cases there is detachment of the retina, in some rupture of the choroid, and in some hemorrhages of the retina and choroid. The vision is most affected in the retinal lesions, and the severity of the effects also depends on the site of the lesion. A very small macular hemorrhage affects the vision much more than a large one elsewhere. In these cases the eyeball is protected by its elasticity and the fibrous structure of the sclerotic. It yields to the shock and only suffers a slight contusion, while the fragile tissues of the retina and choroid are torn or disorganized.

These injuries may also occur by *contre-coup*, a blow on the malar, for instance, being transmitted through the soft tissues till it reaches the eye. The prognosis varies; in some cases there is improvement in vision after a time, in others it grows progressively worse. In some cases atrophy of the disk follows, from fibrous proliferation around it. Treatment is expectant. Time is the only thing that will improve the vision.

A. Goss.

Martin, E.: Partial Occlusion in the Treatment of Aneurisms. *Surg. Gynec. & Obst.*, 1915, xii, 513.

Two cases are reported of arteriovenous aneurism of the orbit treated successfully by the method of partial occlusion of the common carotid, the operation being completed with the ligation of some of the veins of the orbit. The usual cause of pulsating exophthalmos is trauma—over 70 per cent. While the diagnosis of arteriovenous aneurism would seem to be obvious, in a collection of 40 autopsies collected by de Schweinitz and Hallway this lesion was found in but 14. It is therefore essential that the diagnosis be made with some care, the examination including the use of the X-ray and inspection of the nasal fossae.

The operation of partial obliteration is not offered as a substitute for the operation of Matas when the lesion is in an accessible position, but only when such treatment is impractical. The substitution of partial for complete occlusion of the carotid is advocated because partial occlusion, particularly if it be but temporary, is necessarily a safer measure in so far as brain function is concerned. An absorbable ligature material is preferred to silk, as the purpose is merely the temporary slowing of the blood stream, the ligature being tightened till the bruit heard over the exophthalmos and its pulsation cease, or, local anæsthesia having been used, the patient ceases to complain of the rhythmically throbbing tinnitus, and because, according to the researches of Sweet, arteries discharge into their lumina, constricting silk threads.

After operation the patient should be given injections of human blood serum to favor clotting, and they should be kept at rest for at least two weeks.

EAR

Murphy, J. W.: Brain Infection of Otic Origin, with Report of Five Cases. *Laryngoscope*, 1915, xiv, 701.

The author discusses (1) the site, (2) diagnosis, and (3) treatment of brain abscess.

1. When the infection occurs by direct continuity, the temporosphenoidal lobe is most frequently the site of the abscess; but when the extension is through the labyrinth, the abscess is most often on the anterior aspect of the cerebellum.

A temperature nearly normal or slightly subnormal, a slow pulse, slow respiration, slow cerebration, and lack of sustained attention, mental obscurcation, and a tendency to dore even when talking, all point strongly to a cerebral abscess. When the abscess is in the cerebellar region, the respirations are slower and more apt to be irregular and of the Cheyne-Stokes character. Attention is directed to the importance of third nerve paralysis as a diagnostic sign.

As to the treatment, early evacuation is demanded. Where the abscess is situated some distance from the dura, the author uses a long Weiss' cataract knife, as less trauma is thereby produced.

Five cases are reported in which the origin of the abscesses were traced to a lesion in the middle ear. In the three operated cases the lesion was traced at the time of operation and in the two non-operative fatal cases at the post-mortem.

These cases are interesting from the slight symptoms present up to within a few hours of the time of operation.

Orin M. Kern.

Dench, E. B.: An Improved Technique in the Application of the Thiersch Graft in the Radical Operation for Chronic Middle-Ear Suppuration. *Laryngoscope*, 1915, xxv, 755.

During the past six or seven months the procedure has been as follows: A large graft is made to line completely the middle-ear cavity. A second graft, about an inch wide and one and one-half to two inches long, is then applied to the posterior margin of the lung wound, completely covering the posterior margin of the cavity, and sometimes overlapping the graft already applied to the radical cavity. This second graft is spread out posteriorly, and the portion extending into the middle-ear cavity is held in place by a firm gauze packing. The portion of the graft which extends posteriorly is then bent forward upon itself, threaded through the external auditory meatus, and spread out so as to completely cover the cut margins of the canal. The auricle is then sutured back in place. The meatal portion of the graft is held in position by a second strip of gauze, carried through the external auditory meatus.

Instead of using two grafts the author at times also used one large quadrilateral graft, applying it in the same way.

OTTO M. ROTT.

Fraser, J. S., and Owen, J. S.: Case of Subacute Purulent Otitis Media, Labyrinthitis, and Purulent Leptomeningitis Due to a Capsulated Streptococcus. *Edinb. M. J.*, 1915, xv, 269.

The report of this case is given in great detail, the remarkable features of which are: (1) the rapid subsidence of the meningitis, the stage of delirium followed by semi-coma lasting only 48 hours; (2) the fact that a case of purulent otitic meningitis may recover without operation.

OTTO M. ROTT.

Yankauer, S.: Report of a Collective Investigation on the Curettement of the Eustachian Tube in Chronic Aural Suppuration. *Laryngoscope*, 1915, xxv, 675.

This report is based upon the experiences of 119 operators in 735 cases. An elaborate table analyzing the results of the different operators is given in the original article.

Of the 735 cases the tube was successfully closed after one or more curettings in 609, or 83 per cent. The number of patients reported cured is 379, or 51.5 per cent of the total number, or 62 per cent of the number in which the tube was successfully closed. Thus it appears that more than one-half of all cases of chronic suppuration of the middle ear have been cured by closing the eustachian tube

through the intact external auditory meatus and without other surgical treatment.

Of the cured cases, 51.5 per cent, the hearing was improved in 46, or 90 per cent.

Improvement in the tinnitus occurred in half of the cases operated upon.

Of the cases that were not cured by curetting the tube, 70 were subsequently subjected to radical operation and the result reported in 68. Of these, 60, or 88 per cent, were reported as cured.

The final conclusions of the author are as follows:

1. Closure of the eustachian tube is harmless because it does not cause the loss of any function which has not already been permanently destroyed.

2. It is a valuable therapeutic agent because by it alone half the cases are cured and the rest so improved that it is possible for the radical operation to cure most of them.

3. It is imperative, not only because the tube has assumed a perverted or pathological function, but because the only other resource which is open to the patient is a radical operation, in which case the tube must be closed anyway.

4. Every patient should be given the benefit of this procedure, not only because the chances of cure are sufficiently high, but also because, if cured thereby, the hearing will not only be preserved, but improved.

5. On account of the difference in the effect upon the hearing, the radical operation should be regarded as unjustifiable in any case where there is useful hearing left until a thorough trial has been given to the closure of the tube alone through the intact auditory passages.

OTTO M. ROTT.

Sewell, D. L.: Indications for Operative Interference in Cases of Aural Discharge. *Med. Chron.*, 1915, lxi, 49.

The author mentions the following signs and symptoms in acute suppurative otitis media which call for exploration of the antrum and mastoid cells: (1) pain, persisting for forty-eight hours, in spite of paracentesis; (2) mastoid tenderness; (3) fever; and (4) persistent copious discharge.

In a case of chronic suppuration of the middle ear, the following indications for surgical interference are mentioned. (1) a discharge which persists in spite of treatment; (2) a discharge which is fetid, blood-stained, or contains cholesteatomatous material; (3) recurring polypi; (4) carious bone; (5) fistulae; (6) pain; (7) tenderness; (8) headache; (9) vertigo with or without nystagmus; (10) increase of deafness with diminished bone conduction; (11) facial paralysis.

OTTO M. ROTT.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Kaempfer, L. G.: Blood-Platelet Extract, a Physiological Hemostatic, in Nose and Throat Surgery. *Am J Surg.*, 1915, XLIX, 401.

The substance in question is a yellow granular powder called coagulen. Kaempfer uses it in a ten per cent solution locally in tonsillectomies and following turbinectomies and the submucous resection of the septum. The solution should be freshly prepared before using.

After the tonsil is removed, a sponge that has been dipped into a freshly prepared ten per cent solution of coagulen is placed in the fossa and gentle pressure maintained for a minute. Occasionally a second application is necessary, but in the series of 25 cases reported there was no subsequent bleeding.

In turbinectomies the nose is packed with gauze wet with the solution and this packing removed in twelve hours. Sometimes there was slight oozing, which however stopped of its own accord.

In the submucous resection cases a piece of rubber tissue was first placed over the incision, then the nose was packed as before, after which the rubber tissue was removed. The packing was removed in twelve hours with little if any oozing and no hamatoma.

OTTO M. ROTT.

Andrews, B. F.: Some Reflex Manifestations of Intranasal Origin; Suggested Nerve Paths Through Which They May Travel and Operations for Their Relief. *J. Ophth & Otolaryngol.*, 1911, IX, 354.

After an anatomical review of the pathway of the trigeminals with its various ganglia, the author mentions the different reflex manifestations produced and the rhinological factors responsible for them, together with operations for relief.

The reflex manifestations mentioned are: (1) headaches, (2) eye strain or spasm of accommodation, (3) earache, (4) deafness attributable to eustachian closure, (5) coughing, (6) sneezing, (7) asthma.

The conditions mentioned as responsible for these manifestations are:

1. Septal ridges, spurs, bands, etc., where pressure is made against other intranasal parts.

2. Malformations of the middle turbinate where it is bent on itself or makes pressure either on the lateral wall or on the septum or on the inferior turbinate.

3. Hypertrophied middle turbinate.

4. Middle turbinate containing pneumatic cells.

5. Pressure of the inferior turbinate upon surrounding structures.

6. Nasal adhesions and cicatricial scars.

Operations mentioned are:

1. If the septum is at fault, a submucous resection should be done.

2. If the turbinates are deflected, they should be sprung in the opposite direction with little force and broken along their bony attachments, and kept in the new position by cotton pledgets placed on each side.

3. If the turbinates be too thick, they may be thinned by grasping them between the blades of suitable forceps and crushing them.

4. When the middle turbinate contains a large pneumatic cell, the turbinate is split through the cell from top to bottom and the lateral segment removed, and if necessary the remaining portion fractured along its bony attachment and moulded over until it occupies a position midway between the septum and the lateral wall, free from either.

In closing, the author makes a plea for the removal of the cause at its source instead of by ganglion injection or destruction.

OTTO M. ROTT.

Ingram, L. C.: The Progress of Intranasal Surgery. *J. Fla. M. Ass.*, 1915, II, 134.

The author speaks of the progress along the lines of conserving organs and correcting deformities which cause irritation and prevent proper aeration and drainage. As an illustration of this principle he cites the submucous resection of the septum, the crushing and straightening of the turbinates, and the submucous opening for drainage of the maxillary sinus.

The crushing and straightening operation for hypertrophied and displaced turbinates is performed by crushing with a nasal dressing forceps the end of the turbinate along its entire length, beginning at the anterior end and making successive bites. If the turbinate is too near the septum it is fractured and placed to the outer wall. Sufficient atrophy occurs within a month's time.

To perform the submucous opening of the maxillary sinus, an incision is made through the mucosa and periosteum at the angle on the superior maxillary bone where the inferior fossa meets the facial surface. The tissues are elevated and the exposed end grasped with a forceps and crushed, fracturing the inner surface. The fragment is then elevated and removed, and a biting forceps slipped into the opening enlarges it as much as is necessary.

OTTO M. ROTT.

THROAT

Swift, W. B.: Can the Speech Present a Sign of Congenital Syphilis? *Boston M. & S. J.*, 1913, LXVIA, 519.

The conclusion is that congenital syphilis can cause a faulty or incomplete development of vocal cords that results in vocal monotony and harshness in both conversation and weeping. As spirochaetosis has been of late offered to cover all the lesions of syphilis, the author proposes as a name for this symptom scaphoid vocal cords and spirochaetotic harshness.

Blum, S.: The Proper Position of Tonsillectomy in Pediatrics. *Arch. Pediatrics*, 1915, XXXII, 817.

The author decries the frequency with which tonsils are enucleated and adds that there are too many unwarranted indications for tonsillectomy. He advances the following reasons for conserving the tonsils:

1. It is improbable that they would occur in the human body if they were superfluous.
2. As modified lymph-glands they may combat infections. This view is supported by Brieger's, Goerke's, and Stoke's observations of the emigration of lymphocytes from the center to the periphery of the tonsil.
3. It has been suggested that they furnish an internal secretion of value.
4. The tonsils may be eliminative organs for the waste products of dentition (Wright).
5. They may be eliminative organs for systemic diseases, including diphtheria and scarlatina (Ashurst).
6. They play a rôle in the modulation of the voice.
7. They moisten the food and perhaps throw out a digestive ferment.

8. There is an intermediate course to be considered; namely, tonsillotomy.

9. They take up foreign matter from the nasal mucous membrane.

10. Animal experimentation by the author proved that tonsils are excretory organs for the cervical glands.

The author's conclusions are:

1. Tonsillectomy is an excellent surgical procedure in certain cases.
2. It should be the operation of choice in malignant disease of the tonsils.
3. It may be indicated in recurrent peritonsillar abscess.
4. It should not be performed in infants.
5. Only in exceptional cases should it be performed before the eighth year. Between the eighth and fourteenth years if positive evidence of serious local or systemic injury emanating from diseased tonsils can be adduced, and if the tonsillar affection does not yield to conservative treatment, enucleation is indicated.

OTTO M. ROTT.

MOUTH

Ulrich, H. L.: The Blind Dental Abscess. *J. Am. M. Ass.*, 1915, LV, 1619.

The author has found abscesses in 83 per cent of all dead teeth and apical abscesses in 68 per cent of artificially devitalized teeth. He is convinced that the apical abscess is an evidence of a focus of streptococcal focal disease and that these foci are not primarily dental but hematogenous in origin. He bases his claims on the facts that focal reactions, development of new foci, and improvement of other focal areas have followed the removal of the abscesses, and local and focal reactions have followed the use of autogenous vaccines.

JAMES R. MARTIN.

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SURGERY OF THE HEAD AND NECK

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INTERNATIONAL ABSTRACT OF SURGERY

APRIL, 1916

COLLECTIVE REVIEW

THE SIGNIFICANCE OF BACTERURIA

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ATTENTION was first called to this condition in 1881 by Roberts (1) who reported three cases in which the urine at the time of examination was conspicuous for its fetid odor, opalescence, and the large number of micro-organisms found microscopically in a fresh specimen, and which at the time of examination or prior thereto had suffered from slight subjective urinary symptoms. In 1886 Schottelius and Reinhold (2) reported additional cases and in their discussion of the same drew a clear distinction between this and other urinary conditions. Ultzmann (3) in 1888, from an analysis of the conditions found in the urine, inferred that there was no inflammatory reaction on the part of the urinary mucous membranes. This inference was proven correct by the first reported autopsy published by Steinbeck (4). Ultzmann suggested as etiological factors the use of instruments introducing infection within, or an old focal lesion such as chronic prostatitis, and Reinberg (5) in 1891 advanced the hypothesis that this condition was part of a general infection. Melchior (6) observed a case during convalescence from pneumonia, the patient having previously suffered from bladder symptoms. The earliest comprehensive monograph was written by Krogus (7) in 1894, who reviewed the literature and case reports critically, evolved an excellent definition,¹ discussed the etiology and particularly the condition of the urine, called attention to the frequent presence of

albumin in his cases, attributing the growth of the bacteria to the presence of the same. In 1896 the subject was given a place in the general works on urinary diseases by Rovsing (8) who devoted an entire chapter to the matter. Since that time several important monographs have been published, notably by Barlow (9), Kornfield (10), Weisz (11), and Cnopff (12). Excellent bibliographies are to be found in Kornfield's (*loc. cit.*), Barlow's (*loc. cit.*), and Albeck's (13) works. Excellent case reports are given by Fekeli (14), Rosenheim (15), Jehl (16), Monie (17), Predohl (18), Ross (19), Reymond (20), Goldberg (21), Wolff (22), Goldenburg, H. (23), Hogge (24), Bonn (25), Warburg (26), Peyer (27), Aureille and Renaud (28), Saterlee (29), Raskai (30), LaRoque (31), Pollock (32), Wingrave (33), Goldenberg (34), Pedersen (35), Parkinson (36), Smith (37), Williams (38), and many others, of whose reports some will be included in the following discussion as illustrating particular phases of bacilluria.

Standing at the threshold of pathological activity the study of bacterurias is inseparably bound up with the study of immunity. Although our knowledge of immunity is far from adequate, recent additions to the literature have done much to increase our understanding of such conditions as are met with in bacterurias. These advances have been made for the most part in the field of acute infectious diseases, which field also offers examples of bacteruria; e.g., typhoid bacilluria, in which the entrance of the bacteria into the urine from the blood stream involves

¹ Defined as a condition characterized by an abundant growth of bacteria in freshly voided urine with absence of urinary symptoms and without evidence of any inflammatory process in the urinary channels.

the renal epithelium alone. In discussing this type of bacterurias one is limited to the discussion of blood-borne infection and thus the uncertainty concerning the route by which the invader reaches the kidney can be avoided, as well as the long discussion pertaining thereto. A study of this group of bacterurias will therefore afford better ground for the understanding of blood-borne (hæmatogenous) infection and will also lead itself better to the study of the immunity factors involved. For this reason brief reference will be given to that type of bacterurias which arise during the course of a bacteremia in one of the acute infectious diseases. Because of the relative insignificance of the urinary condition and the importance of other manifestations of these infections, the study of their bacterurias has been given over to the field of internal medicine, and those bacterurias in which the urinary condition is paramount have been left to urology. The last group will be studied more extensively.

Pure bacteremias are rare, the great majority being associated with one or more predominate focal lesions, either primary (lung in pneumonias) or secondary (metastatic as streptococcal rheumatic periarthritis), which give to a disease its distinctive clinical characteristics. Occasionally an infection is so overwhelming that death ensues before these focal symptoms can make themselves manifest in anywhere near the usual degree. Regardless of the type of invader there is a marked uniformity in the symptomatology of this class of cases. Much more common are instances of infection that manifest themselves only at the primary lesion (Koch-Weeks' bacillus) or in which the only clinical, and oftentimes the only detectable, pathological feature is to be found in the secondary focus (streptococcal rheumatic infection). It would seem, therefore, a hopeless task to correlate the diversified manifestation of diseases of bacterial origin, but even where one encounters two organisms that differ widely in pathogenic properties there is very often a third which bears a very close resemblance in cultural, morphological, and biological characteristics to the one and to the other an equally close resemblance in the lesions it produces or in other characteristics peculiar to bacteria. Thus there is a wide discrepancy between the pneumococcus and the Koch-Week's bacillus but the latter is closely related to the influenza germ in cultural and biological and other properties, while the influenza bacillus often causes a pneumonia that closely resembles that caused by Fraenkel's organism (pneumococcus). As we

extend our bacteriological knowledge instances of such parallelisms and repetitions multiply (compare Mendeleff or "Periodic Law in Chemistry"). Thus in nearly all the groups (streptococcus, anthrax, plague, influenza, pleuropneumonia of filterable viruses in cattle, hereditary syphilis among the spirochaetes, glanders, meningococcus and typhoid) there are examples of a general infection with pneumonia. Taking the streptococcus group as a type the anthrax, plague, etc., lung infections run a close parallel especially when, as in the case of the pneumococcus, the primary infection is in the lung. A primary infection at this site always results in the most severe type of infection. In the other groups the primary focus is generally elsewhere and the lung manifestations less typical (lobular). Instances of general infection among groups heretofore not affording any such examples are increasing. The corynebacterium (of which bacillus diphtheria is an example) has long been cited as an example of a micro-organism that remains strictly local, its remote effects being due to toxins, but Bunting (30) has shown that a corynebacterium is probably the cause of Hodgkin's disease, and is recoverable from the glands, so even this group invades the circulatory fluids, at least the lymphatic portion. Thus the phenomena found in one infectious disease can often be correlated with the phenomena found in another by comparison with a third of which the exciting agent resembles both exciting agents of the first and second. In this way where direct evidence is wanting in any one infection, it can be adduced from observations on other infections brought into relation in this manner. This applies especially to such studies as immunity. In general this procedure greatly broadens one's conception of the phenomena found in infectious diseases. From this viewpoint, inasmuch as certain members of the typhoid-colon group give rise to bacteremias that in turn give rise to bacterurias, one may look for the same train of events in other groups (streptococcus, bacteremias with bacterurias, etc.). One need not necessarily expect to find them, for this sequence may be due to peculiarities of members of the typhoid group that gives the typhoid organism its individuality. At any event this sequence found in the typhoid group will find parallelisms in other groups more or less complete. Thus direct evidence and evidence by exclusion will be at hand that will determine the factors necessary for this interesting condition.

Bacteria are recoverable from the urine during the course of bacteremias in such a vast number

of cases as to give rise to the belief that the urine is quite universally invaded in this condition (40). Positive results are reported in pneumococcus (at height of fever) (41), in streptococcus (42), (43), in Malta fever (at fifteenth day) (44), in plague (45), in anthrax (46), (47), in typhoid (48), (49), in infections with bacillus proteus (50), in paratyphoid infections (51), in spirilla of relapsing fever (52), in cholera (53), and even the filterable viruses, as shown by infectivity, are found in the urine of scarlatina and varicella patients (54). Bacteria are even found in the urine in acute infectious processes that are ordinarily well localized in contradistinction to the bacteræmias. Cnopff (12) observed cases of staphylococcus late in the course of acute anginas, and the Klebs-Loeffler bacillus has been recovered from the urine in cases of diphtheria (56). In pyæmias positive findings are common, but in this condition we are sure to find one or more foci that are pouring pathological debris other than bacteria into the blood stream favoring the formation of infarcts and emboli which can inflict local damage independent of the infective agent.

Notwithstanding the frequency and wide range of types, clinically bacterurias in the course of bacteræmias are practically limited to members of the coli-typhoid group. So in the bacteræmias commonly met with outside the general infections, those caused by the bacteria common to the skin and mucous membranes, a member of the same group, bacillus coli predominates, and among the chance infections are found in like proportions other members of this group, bacillus proteus, bacillus lactis aerogenes. A striking parallel is observed in comparing typhoid with other enteric infections that have ulcerative lesions also (follicular enteritis), and in which the bacillus coli plays an important rôle (57), (58). Here Trumpf (59) found bacillus coli in the urine in fourteen out of seventeen consecutive cases in children. He notes the similarity between this condition of the urine and that observed in typhoid.

There is a wide range in types of infections that are brought to the urine in the course of the general infections (especially the essential fevers) without producing a bacteruria; there is also a wide range in the virulence of the members of the typhoid group that are found in this condition. It would therefore seem as if this group was peculiarly adapted to this locality, in other words that the urine afforded a suitable habitat for this and not for other groups. If this be true, members of this group can be grown in

sterile urine. This has been accomplished with bacillus typhoid (Connell *loc. cit.*) and bacillus coli (Brenan, (60). Both observers found a low degree of acidity, especially as regards organic acid content (Connell, *loc. cit.*), essential for growth. Connell (*loc. cit.*) found that albumin, contrary to the views of Krogus (*loc. cit.*), was not essential. Ordinarily only a limited number of types can thrive on a media whose nitrogen content is limited to amino-acids of so low an order as are the urinary nitrogenous compounds. This fact explains why the urine infected in so many instances fails to develop a bacteruria. Acidity is the rule in the typho-colon group; bacillus proteus is always found in alkaline urine and the staphylococcus and streptococcus in amphoteric or feebly alkaline urine.

The contention that the conditions in the urine are suitable for propagation of the typhoid and allied germs is supported by the findings in the biliary fluids, the latter being so much more suitable for the growth of bacillus typhoid that bile media has been suggested as a means for isolating that organism (Conradi, Foerster).

The pathogenicity of these urinary invaders has been well established (Mellin 61). Sheele (62) cites a case of a servant who drank the bacilluric urine of his master, convalescent from typhoid, and was himself infected. Between blood and urinary forms there is apparently no difference (64). Tinctoral, cultural, and biological reactions are identical and serological tests confirm the identity. Serological tests are scarcely refined enough to detect fine distinctions in type except with most careful technique, as shown by Kohlmer in his studies of streptococcus and diphtheria types (63). Recently Patrick (*loc. cit.*) has shown atypical forms in bacilluric urine of enteric fever, so our views on the fixity and identity of types may need revision. However, there is no question as to the existence of virulent (bacillus coli, bacillus typhoid) forms and practically avirulent (bacillus coli, bacillus lactis aerogenes) forms, forms that in virulence resemble the sarcinæ sometimes found flourishing in fresh urine. The remarkable feature of it all is that in spite of such wide variation in virulence and pathogenicity there is great uniformity in the urinary condition without local tissue reaction (pyuria).

Before this feature is discussed it will be well to determine what part the renal epithelium plays in the transfer of bacteria from blood to urine. The frequency with which bacteria have been found in the urine has led to the belief that the passage through the epithelium is a simple

matter in which the rôle of the epithelium is but passive (Elliot, *loc. cit.*, La Roque, *loc. cit.*). Inasmuch as bacilluria is met with in but 24 per cent of typhoid cases (Connell) it is apparent that this condition must be associated with active factors which are able to limit its frequency. This conception of the part played by the kidney has its origin largely in a statement of Conheim (64) concerning the ability of the kidney to eliminate bacteria, and is supported by no little experimental evidence (Phillipowicz, *loc. cit.*, Dantsch, *loc. cit.*, Finkelstein and Prior, *loc. cit.*, Krausz and Biedel (65) and others). Bacteria injected into the blood were recoverable in the urine (oftentimes looked for post-mortem only) without evidences of albuminuria or macroscopic evidence of kidney lesions in the few post-mortem observations recorded. If this contention be correct bacteria of low virulence ought to be found in the urine after intravenous injection. Wossokowitsch (66) compared the incidence of bacteria in the urine after intravenous injection of organisms of negligible and organisms of high virulence respectively. In no instance was he able to obtain any of the former in spite of massive doses, but his findings were almost universally positive when virulent cultures were used. Signs of renal damage were frequently encountered both in the urine and post-mortem. Wossokowitsch gives a very critical review of the results obtained by others with a detail that is essential in comparing results in which there is so wide a variation in technique. His conclusions are that passage of bacteria through the kidney is only possible in the presence of renal (focal or other) lesion.

Some corroborative evidence can be obtained from autopsy records in typhoid. Bouchard (67) in nine consecutive autopsies found in all lesions common in the nephritides of acute infections and within these lesions bacteria which he did not identify. Konjaeff (68) found uniformly focal lesions (lymphomata consisting of round and endothelioid cells) containing typhoid bacilli, structures similar to "rose-spots." He concluded that these lesions were the essential starting points for bacterurias. It is an interesting coincidence that bacilluria appears at the time or subsequent to the appearance of "rose-spots" and is said to be more frequent in cases with severe eruption.

Attempts have been made to adduce additional evidence from clinical observations on the urine (Connell, *loc. cit.*, Jacobé, 69), and as a matter of fact at some stage there is to be found albumin, casts, or blood in the great majority of cases but

there are always a few in which these findings are persistently absent. Marchildon (70) cites two cases in which there was found post-mortem a typhoid spermatocystitis, an example of focal lesion in which evidence of renal lesion need not appear. While therefore no indisputable conclusions can be drawn, the evidence is largely in favor of the contention of Wossokowitsch, and one must be prepared to look for these lesions or their clinical evidences in hematogenous urinary infections in general as well as in the acute infectious diseases.

Attention was called to the fact that bacteria found in bacterurias varied widely in pathogenicity and yet notwithstanding the conditions in the urinary tract were remarkably uniform. It is not uncommon to find virulent forms on mucous surfaces without evidence of inflammation, e.g., diphtheria carriers, but this occurs in individuals naturally immune or in convalescence, when there exists an acquired immunity. In typhoid this relation between pathogen and mucous surface is established long before convalescence (immunity) while the disease is still active.

There are good reasons why such a condition should exist. The urinary membranes are known to offer unusual resistance to invasion of pathogens (Rovsing, *loc. cit.*, Finkelstein, 7). The part played by mucous membranes independent of vascular reaction in controlling infection has been interestingly shown by Hoffman (72). An infection on such a surface tends to spread laterally in all directions as long as the epithelial structure or subjacent lymphatics are homologous, but when there is a change in the same (pavement to columnar epithelium, richness to paucity in subjacent lymphoid tissue) the line marking such change also marks the limit at which the spread of the infection tends to be arrested. It will spread along the line before it will cross it. Instances are seen especially at the mucocutaneous junctions and in the throat anginas which will cover the throat before they go down into the windpipe. As there is the same concentration of antibodies and the same degree of leucocytosis on both sides of the line there must be a factor of no little potency in the epithelial structures themselves that inhibits infections. This will explain the failure of bacteria with limited virulence to produce a local reaction pus in the urinary membranes but for more virulent forms there must be additional factors.

Typhoid bacilluria occur somewhat late in the course of the disease after the fourteenth day. This late occurrence is also reported in streptococ-

cus ulcerative endocarditis (Wossokowitch, *loc. cit.*) and in Malta fever (Adami, fifteenth day, *loc. cit.*) and the same may generally be said of many other secondary foci. At this time there is evidence in the blood of immune bodies and so there is some additional reason for the control of the urinary infection. Antibodies are known to limit the focal reaction of heat-killed organisms (Bredeska, 73). These relations are better studied in infections that extend over a longer time. There is accumulating evidence that what are regarded as clinical entities in infections are frequently only a stage in a process originating long before and continuing long after the phenomena, grouped as isolated, have given place to other phenomena, the connection between which has not yet been established. Thus Billings (74) and Rosenow (75) have shown that a number of diseases are secondary manifestations of a remote primary infection (especially streptococcal), an initial infection going through a triangle of events, (1) primary lesion, (2) invasion of circulatory fluids, (3) secondary or remote lesion, at wide intervals of time so as to conceal their relations. This interval offers abundant opportunity for the alterations in the host (allergy) and in the parasite (transmutation, Rosenow) that profoundly influence the relations between host and parasite.

Von Pirquet (76) has offered an interesting explanation of the influence of allergy. He considers the natural course of a pathogen capable of producing a general infection on penetrating the body and setting up a disease process to be, as in the exanthemata, a general infection. A bacillæmia in tuberculosis (miliary tuberculosis) is as logical an outcome of a tuberculous infection as a bacillæmia is quite universally the outcome of a typhoid invasion. In the former there has previously been brought into contact with the tissues attenuated or subminimal doses because of the ubiquitous means (air and milk) for the carrying of this infection. In typhoid and the exanthemata contagion is disseminated only intercurrently, as by contact, sewer contaminations, etc. These previous small doses serve to sensitize the patient so that when a dose is received sufficient to cause a disease the reaction produced is so prompt and augmented that the disease is checked and exists only as a local process. Should old age or debility ensue this allergy is lost and a general or terminal infection ensues. This condition makes itself known by a "reaction" which is established and runs its course with a celerity greatly increased

over the normal and which attains dimensions that are greatly in excess of the normal for the size of the dose. Examples are seen in the ocular reaction of Calmette and von Pirquet's percutaneous, or Moro's cutaneous reaction in tuberculosis. Other examples are the well-known tuberculin and mallein tests, also serum anaphylaxis. A peculiarity of this condition is that it becomes established only after a certain incubation period of about ten days. Typhoid bacillurias occur at a later period in this disease. Although it is difficult to determine a general sensibility analogous to the condition found in reactions to tuberculin, typhoid at this stage shows in both the conjunctiva (Chantemesse, 77, Hamburger, 78), and the skin (Floyd and Barker, 79), allergic reactions similar to those found by Calmette and von Pirquet in tuberculosis. It is fair to assume a similar condition in the urinary channels which provokes a heightened reaction the moment there is any attempt at invasion. This limits the process before any manifestation of pyuria is perceptible. Thus the same condition that establishes a local condition and prevents a bacteræmia maintains a bacilluria instead of a pyuria.

Studies in mutations have been made by a few observers, notably by Rosenow (80), who has been able to change a given strain of streptococcus into an entirely different strain and has produced experimentally a number of dissimilar diseases of streptococcal or pneumococcal nature using derivatives of one parent culture propagated under a variety of conditions. More striking are the results obtained on two frogs kept at dissimilar body temperatures (possible in cold-blooded animals without heat-regulating mechanism) and inoculated simultaneously from the same tube. Two widely different types of disease were produced, a pneumococcal bacteræmia and a streptococcal arthritis. These results demonstrate the possibility of marked mutations occurring in the limited time covering the course of an acute infectious disease and enable one to consider the possibility of mutations being a potent factor in determining some of the peculiarities of *acute infections* as well as allergy, both conditions being established as occurring in acute infections. Although the idea of mutations is directly opposed to the teachings of bacteriology the opposition is no better grounded than opposition to transmutations in *matter* which is now well established in connection with radioactivity; e.g., in the radium-thorium-barium group. It is also opposed to a vast amount of experimental evidence on the identity between

bacilluric and bacillæmic forms, notably inoculation (accidental or experimental) tests. If Rosenow's contention is correct, marked mutations can occur during the inoculation and early stages of infection in the frog, and if similar mutations are possible in other infections conclusions drawn from such tests must be modified. Patrick (*loc. cit.*) has shown that variations in type do occur in the course of enteric fever. In six out of seventeen cases he found atypical coli-typhoid forms, all strongly agglutinated by the patient's serum, showing that these organisms must at some time have invaded the body. Six out of seven cases of typhoid in women gave a bacillus coli bacilluria. Whether there was a double infection in the former cases, as was undoubtedly the condition in the bacillus coli cases, or whether these atypical forms were mutants is difficult to determine.

SUMMARY

The transmission of bacteria from blood to urine in the bacteræmias is quite frequent, especially in the severer types of infection.

This transmission in the bacteræmias and from analogy one may infer in hæmatogenous infection in general is a process generally if not exclusively dependent upon damage to the renal epithelium and is usually accompanied by clinical evidence of the same at some stage of the disease. Focal lesions causing bacterurias may occur at other portions of the urinary tract.

Bacteria so transmitted are infrequently propagated extensively and persistently enough to produce a condition known as bacteruria, except in the case of the coli-typhoid group which seems especially suited for this habitat. The striking feature of this condition is that the invading organisms, irrespective of their grade of virulence, and virulent organisms derived from others still active in producing disease, all provoke a uniform and much restricted condition. The reasons for this are perhaps multiple. Some are given:

1. The urinary membranes offer a relatively marked resistance to pathogens sufficient to inhibit the growth of those of limited virulence.

2. The more virulent forms are found in this condition only when an infection elsewhere has provoked an immunological response that may be active in limiting the urinary condition.

3. Allergy is known to exist in a number of infections, including typhoid. In this condition any invasion of local tissues is met by an accelerated and augmented response which checks the invasion before any advanced condition (pyuria) is manifest.

4. While it is not possible to accept as an established fact that mutations do take place in these conditions this phenomenon will serve to explain many features difficult to understand in the coli-typhoid group.

Among the bacterurias that properly belong to the genito-urinary field, i.e., those in which the chief disease manifestation is a urinary process, the typhoid-colon group also predominates. The combined statistics of Barlow (*loc. cit.*), Jeanbeau (81), Elliot (*loc. cit.*) and Albeck (82) include 170 cases in which the following micro-organisms were found: bacillus coli, 70 per cent, streptococci, 15 per cent, staphylococci, 3 per cent, bacillus proteus, 1 per cent, miscellaneous, including sarcinae, 10 per cent. While the typhoid-colon group predominates the incidence of the pyococci is much greater than in the bacteræmias. The reason for this is that these micro-organisms are derived from the pathogens normally infesting skin and mucous surfaces and are able to adapt themselves to altered environment, as has been clearly shown by Rosenow for streptococci. Although the flora on skin and mucous surfaces is extensive the pathogens that commonly show activity are limited. Those that are found in disease processes remote from their normal habitat are still fewer in number. Thus the lung alveoli remote from the normal habitat of naso-oral pathogens are rarely invaded by disease germs causing pneumonia from this habitat except the pneumococci. Staphylococci, streptococci, the gram-negative micrococcus catarrhalis, corynebacteria (xerosis), common in the mouth, are not found here in pneumonias. If to this list we add the bacillus coli group we include practically all the pathogens that are active in disease processes at or remote from their normal habitat. All these have been reported in bacterurias with the exception of the micrococcus catarrhalis. Bacillus xerosis has been reported by Wingrave (*loc. cit.*) and bacillus lactis aerogenes by Leutsch (83) and Goldberg (*loc. cit.*).

Another reason, one commonly given, for the frequency of bacillus coli is the number of intercommunicating channels between gut and urinary passages. A very formidable literature has accumulated in the discussion of this subject, in fact so voluminous that the greater part of the discussion on urinary infections is taken up with a discussion on channels of infection.

The older clinicians, notably the French, Halle, Albarran, etc., were convinced of the frequency of the hæmatogenous route. These

views were supported by the experiments of Posner (84), Posner and Cohn (85), Posner and Lewin (86), and by the critical clinical analysis of Røvsing (87).

Excellent bibliographies are to be found in the works of Schiedemandel (88) and Fromme (89) and others. The logical conclusion that these organisms could be recovered from the blood, was not substantiated. A few positive findings were reported by Czerny, Moser, Escherich, quoted by Cnopff (*loc. cit.*), and Sittmann and Barlow (90) in the living, and by Welch, Marfan, Nann, Mascalgne and Finkelstein, quoted by Cnopff (*loc. cit.*), in the dead (bacillus coli). Albumin is mentioned in case reports (Cnopff, Krogus, Røvsing, Pedersen, Saterlee, *loc. cit.*, Mellin, 91) infrequently in contrast to the frequency of albumin in typhoid bacillurias. Nevertheless it has been repeatedly shown that bacteria are absorbed (subinfection) from the gut and throat. Arbeiter (92) has shown that substances absorbed by the intestinal lymphatics are rapidly borne to the blood stream.

Definite conclusions can not be arrived at regarding the hæmatogenous route until more is known of the fate of these absorbed bacteria.

The urogenous route has long been supported by the clinical and post-mortem observation that whenever any obstructive lesion is met with sustaining more or less of an uninterrupted column of urine from below to the upper urinary passages an ascending infection could almost invariably be traced. This column rested on a urethral flora the common forms of which (Enriques, 93, Lustgarten and Mannaberg, 94, Paltz, 95, Pfeiffer, 96, Hoffmeister, 97, Savor, 98) were shown to be infrequently met with in urinary infections. It was evident that the infection, if brought from without, was brought from the region of the rectum. In a few instances the entrance of the same could be traced to the use of instruments (Krogus, *loc. cit.*), but a vast majority, particularly in women, gave no such history. It was shown, however, that colicystitis was much more common in women than in men and this was attributed to the lack of influence of the urethra because of its short length and proximity of the bladder to the rectum (Brown, 99), and to the predisposing influence of the trauma and congestion at menstruation and in childbearing. The frequency of this infection in infants was established (Buttermilch, 100, Baginsky, 101, Clopatt, 102, Escherich, 103, Finkelstein, 104, Mellin, *loc. cit.*, Trumpf, *loc. cit.*, and others). A good bibliog-

raphy is given by Smith (105), and with it the relative frequency in girl babies. This fact greatly diminished the importance of menstruation but still emphasized the importance of sex and the short urethra. Mellin (*loc. cit.*), however, found colicystitis as frequently in boys as in girls. Meanwhile a clearer conception of the relation between bowel bacillus coli and those found in the urine was established by these studies on children, in whom the relatively simple history gave less chance for doubt as to the mode of origin of the urinary infection. It was promptly established that this was the result of a preceding enteritis, especially follicular enteritis (Escherich, *loc. cit.*, Trumpf, *loc. cit.*, Friedenwald, 106, Smith, *loc. cit.*), a condition favoring absorption by the circulatory fluids.

Inasmuch as the blood proved sterile (Neisser, 107) attention was directed to the work of Wreden (108) who was able to find oil particles and bacterial forms in the urine after artificial stasis, especially in the presence of injury [denuded] to the rectal mucosa. The extent of injury and the degree of stasis necessary were found to vary in the hands of other experimenters. Nevertheless the work of Wreden remained confirmed in the main by such observers as Falton (109), Marcus (110), and R. Kraus (111). The train of events is demonstrated in an exaggerated way by a case of Mellin's (*loc. cit.*) in which the infection absorbed from the rectum induced both an ischio-rectal abscess and a bacteruria. These observations suggested a rôle for gonorrhœa, especially in men, in preparing a passage way between rectum and bladder. (Schlifka, 112, Kornfield, *loc. cit.*) It remained for the anatomists, Caminetti (113), Gerota (114), Kumita (115), Sakata (116), Stahr (117), Walker (118), Zuckerandl (119), and others, to demonstrate a lymphatic route between the rectum and bladder. Recently Francke (120) has demonstrated a lymphatic connection between the kidney and colon by way of the nephrocolic ligament, most constant on the right side. Repeating Posner and Lewin's (*loc. cit.*) experiments he was able to demonstrate this by culture bacteria in the mesenteric lymphatics. He concluded, inasmuch as the right side is most frequently affected (Schiedemandel, *loc. cit.*), that this lymphatic connection favored a right kidney infection. The fact that the ureteral urine is frequently sterile in bacilluric (Kornfield, *loc. cit.*, Weisz, *loc. cit.*, Barlow, *loc. cit.*) and in pyuric conditions (Opitz, *loc. cit.*) argued against this route. Francke, however, injected cultures into the kidney pelvis and at stated

intervals cultured the bladder and pelvic urine independently. He found it possible to obtain sterile pelvic urine in cases where the bladder had become and remained infected. This occurrence he attributed to the fact that there was in the bladder a condition of stasis, as compared with the ureters which favored the persistence of the bladder infection and the removal of a pelvic infection.

It is questionable whether the bladder urine re-enters the ureter in bacilluria as commonly as in pyuria. Instances of reversed peristalsis have been reported (Kuster, 121, Modinski, 122, Posel, 123) in cases where the ureter, has been accidentally severed, and where the entire urine has passed out the severed ureter that from the opposite kidney coming from the distal end of the severed ureter and none from the urethra. Orth (124) holds that bacteria can make their own way into the ureters from the bladder. Reflux of urine during bladder contraction is limited to pathological conditions, inflammatory or neoplastic (Albarran, 125, Courtade and Guyon, 126, Lewin and Goldschmidt, 127, Sampson, 128, Warscheimer, 129. Albarran, *loc. cit.*) also believes that disordered contractions, such as occur in highly irritated (inflamed) bladders, can provoke reflux. Another but unusual method by which infection enters the urinary passages occurs when inflamed adnexa become adherent to the bladder and the infection passes directly through the bladder wall (Raymond, 130 Kollischer, 131).

It will be seen that the matter of channels of infection is oftentimes obscure and complicated. Albarran (*loc. cit.*), Bazy (132), Israel (133), Sampson (*loc. cit.*), report cases infected primarily by the urogenous route in which there was superimposed a hematogenous infection.

The question of channels is, however, more of academic than of practical value. Therapeutic effort must be directed either toward the secondary, or better, toward the primary focus. The studies in children cited above demonstrated the relation of the urinary infection to some antecedent bowel disorder, especially follicular enteritis. Recently this observation has grown in importance in dealing with adults. Williams (*loc. cit.*) treated a number of cases of bacilluria without reference to the urinary condition but solely by measures, such as laxatives, diet, lavage designed to correct the bowel disorder. There was nearly always a clearing up of the urine when the bowel condition became normal.

Inasmuch as the appendix is one of the most frequent seats of local infection in the intestine

it is to be expected that cases of bacilluria could be traced to this origin and such instances are reported by Thompson (134), Landien (135), and Janet (136).

Inasmuch as the object of the discussion is to portray the significance of bacteruria rather than its pathology, discussion of the additional pathological features will be limited to two observations. One is the frequency of small quantities of pus-cells in the urine, the significance of which has not always been explained. Raskai (*loc. cit.*) made an interesting observation of a case of bacteruria following a posterior gonorrheal infection. A catheter was passed into the bladder and thorough lavage instituted, the bladder allowed to empty, and the catheter left *in situ*. Clear urine passed through the catheter for some time. The catheter was then withdrawn and the prostate massaged. A fluid rich in bacteria and with few pus-cells was obtained. The prostate was undoubtedly the origin of this bacilluria. Similar conditions are met with in cases where a bacilluria follows a prostatic massage (Geraghty, 137). Other instances of a focal infection, e.g., pyelitis (Kornfield, *loc. cit.*), are reported. Kornfield regards these as complications and rejects the case of Raskai. However, if the contention of Wossokowitsch is correct instances of focal infection must be common and these citations in which it is possible to determine a prostatitis or pyelitis are but instances in which this focal point is exaggerated and has been determined.

The existence of focal infection would explain the frequent existence of pus-cells. Of course there are infections like the sarcinae (Jacobi, *loc. cit.*) in which the urine acts as a culture medium, the urinary membranes playing an entirely passive rôle like a container or culture tube, and other micro-organisms than the sarcinae are to be found in a like condition. In such instances no focal point is to be expected. Another peculiar pathological feature is seen in the mucoid discharge first reported by Janet (138) as coming from the urethra and found to contain practically neither organisms nor cells. The discharge ceased when the bacilluria was cured by bladder lavage. A mucoid discharge in the form of casts is reported by Pollock (*loc. cit.*) and similar masses were observed hanging to the bladder wall during cystoscopy by Kornfield (*loc. cit.*). Janet (*loc. cit.*) attributed these to the irritating effects of the toxins in the urine. These observations are important as indicating a reaction on the part of the mucosa and form the connection between the passive membrane and

one in which traces of inflammatory reaction is to be seen.

The symptomatology varies more widely than the pathology (Cnopf, *loc. cit.*, Weisz, *loc. cit.*, Kornfield, *loc. cit.*, La Roque, *loc. cit.*, Wingrave, *loc. cit.*, Elliot, *loc. cit.*, etc.). From a symptomless condition undetected until urinalysis, or one provoking mild local symptoms (pollakiuria, dysuria) or symptoms so severe (abdominal pressure) that a condition of gastro-enteric disorder is simulated and oftentimes diagnosed, this disease may provoke a variety of remote manifestations of greater or less severity. The remote symptoms (headache, chills without fever, polyarthritides, anemia, etc.) are provoked by absorption of toxins through accidental abrasion. The amount absorbed must be small and the potency limited, as shown by Smith's case (*loc. cit.*) in which a cystotomy for stone in the presence of bacilluria was followed by symptoms of general sepsis of short duration and without manifest pyuria. Hence these general symptoms must be the result of allergy in a number of cases where their severity is disproportionate to the quantity and toxicity of the material absorbed. No reports of allergy in bacillus coli infections have been found. Immune bodies (opsonins, agglutinins, bacteriolysins) have been found by Davis (139) in great variations, opsonification, agglutination, bacteriolysis occurring in wide variations and not running parallel, and while increased by therapeutic inoculation the increase did not run parallel.

If the symptomatology is variable the treatment recommended is more so. All are agreed on the rationality and benefits of urinary antiseptics (hexamethylamine) in large doses (Churchman, 141). Lavage is recommended (Geraghty, *loc. cit.*, Janet, *loc. cit.*, Connell, *loc. cit.*) and condemned (La Roque, *loc. cit.*). Vaccines have been successful (Aureille and Reynaud, *loc. cit.*) and unsuccessful (Geraghty, *loc. cit.*) where other measures have failed. Treatment of the primary focus (Geraghty, *loc. cit.*, Williams, *loc. cit.*, Wingrave, *loc. cit.*) is being advocated more and more. A searching investigation of the entire urinary tract is necessary as well as a study of the condition of the bowels and other locations for primary foci. Raymond was compelled to resort to a nephrectomy to cure a rebellious bacteruria that was kept up by stasis in a congenitally dilated pelvis. These diverse modes of treatment all applied with some degree of success, indicate that a complex condition exists in bacteruria as regards location or the primary focus, the location of some focal point within the

urinary membranes, the presence of stasis, etc. When care is taken in diagnosis to determine the existence or absence of these conditions and their site, if present, a more rational and successful therapy will follow.

SUMMARY

The bacterurias that properly belong to the genito-urinary field are caused by a limited number of organisms, among which the bacillus coli predominates 70 per cent, and the remaining are chiefly pyococci.

The prevalence of bacillus coli types is due to their ability to make the urine their habitat. It is undoubtedly favored by the existence of a number of channels active in carrying infection from gut to urine.

The existence of a hæmatogenous route is without experimental evidence and the clinical evidence is both indirect and derived from cases of pyuria rather than bacteruria where the severity of the process is greater. Bacteria are known to be absorbed from epithelial surfaces (subinfection) and penetrate into circulating fluids. Their further fate is conjectural, except in a few instances, such as the streptococcus whose relation to rheumatic diseases has been established. Until we know the fate of these bacteria we are unable to determine the significance of the hæmatogenous route.

The urogenous route is active in carrying infection from the bladder to the kidney and in some instances the urethra serves as a channel for the introduction of infection. The predominating flora of the latter is rarely found in urinary infections, consequently the conditions necessary for the introduction of the infecting organism through the urethra must be extraordinary.

The direct lymphogenous route rests on experimental and anatomic evidence. Clinically, one seldom meets with conditions that enable one to trace the various steps in the infection of the bladder from the rectum. Infection by continuity from adherent adnexa has been observed but is rare.

The members of the colon group found in bacterurias vary widely in virulence. Notwithstanding there is a marked uniformity in the reaction found in the urinary passages (numerous bacteria, generally a few pus-cells, and at times mucoid secretion). There is frequently a focal infection in the urinary walls which accounts for the few pus-cells and to which the persistence of the bacteruria is due.

The limited pathological reaction is easily explained in the avirulent forms where the urinary

membranes are passively serving as a container or culture tube for the media — the urine. In the more pathogenic forms it is probable that a condition of allergy exists which results in an enhanced reaction, whenever there is the infection attempts to progress. This is sufficient to check the process before a condition of pyuria becomes manifest or remote lesion can be implanted. A condition of allergy can maintain a bacilluria instead of a pyuria just as the same condition maintains a local instead of a general infection (von Pirquet). This hypothesis also accounts for some peculiarities in the general symptoms. For more rational therapy a more careful diagnosis is needed, especially as to the existence of focal infections either within the urinary walls or remote at the primary site.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Markoe, J. W.: Open-Air Treatment in Surgery. *J. Lancet*, 1915, xxv, 649.

Markoe's desire is to develop more interest in the open-air treatment in surgery. Rollier is given the credit for developing a system by his careful method of exposing. Regret is expressed that this mode of treatment is not being used more as a matter of routine than as a last resort. Just what action the solar rays have is as yet not fully understood. Ultraviolet rays can penetrate the normal skin only a fraction of a millimeter; but if the skin is made anæmic by pressing out the blood, bacteria can be killed by means of the rays even after the passage through 4.25 millimeters of skin. Therefore, patients suffering from the anæmia of hæmorrhage or anæmia from any cause, should be more carefully exposed than those in whom the skin has a normal blood supply.

Crile is quoted as being enthusiastically in favor of open-air treatment of wounds in the military hospitals of France. Aimes, Willy Meyer, Pryor, are each quoted as favoring this treatment, especially in surgical tuberculosis. Young and Williams of Boston are quoted as reporting 133 cases of severe puerperal infection treated in the open air, with a mortality of 24 per cent, excluding from calculation cases in which death occurred within forty-eight hours of admission to the hospital.

Markoe reports 110 cases of sepsis, conducted under two groups: those treated indoors and those treated in the open air. Of these, 42 were in the hospital less than five days, with a mortality of 100 per cent; 68 were in the hospital more than five days with a mortality of 66 per cent. In this series all but 18 had severe complications. Of the 110 patients, 53 were treated in the open air in addition to other measures; and 57 were in-door patients of whom 55 died and 2 left against advice. Of the 53 cases treated on the roof, 17 were treated less than five days and all died; 13 died who were more than five days, 1 left against advice; and 22, or 42 per cent, recovered. In addition innumerable cases were treated in the open air where infection was localized in the pelvis.

Patients given the outdoor treatment seem to withstand high temperatures more readily and they enjoy and assimilate their food much better.

After being on the roof for a few days their facial expression changes from one of anxiety and despair to that of hope and assurance. The hæmoglobin and red cells increase. The most marked effect observed is the tolerance which these patients show for those symptoms that before served to depress the organism. The open-air treatment is conducted according to the rules laid down by Rollier which are fully described in this article. EMIL C. ROBITSHEK.

Sherman, W. O.: A Standardized Treatment of Wounds; Report of 77,000 Cases. *Am. J. Surg.*, 1915, xxix, 448.

The Industrial Compensation Commission of the state of New York reports that 17 per cent of all cases applying for compensation are infected. Other states probably show a like percentage of infection. This is a rather shocking state of affairs, and one that should be remedied speedily. When we consider that it takes three times as long for an infected case to recover as a non-infected case, the economic phase must be apparent. The infection is also productive of much suffering, often the loss of extremities or their function, and sometimes death.

With the idea in mind of perfecting or standardizing a surgical technique in the treatment of open wounds, the author with three assistants outlined certain rules and principles to be followed. These had to do with the proper first-aid, the preliminary cleansing, the rational use of antiseptics, and aseptic technique.

During five years, approximately 250,000 men were employed in the works under observation. These men were employees in the iron and steel industry, each company having a surgical organization which co-operated and was in harmony with the operative management.

Rules were given for methods of procedure for the treatment of the various classes of wounds. These rules were not arbitrary, but allowed each surgeon full latitude in the choice of methods, only asking that he use a treatment for each condition in accord with the principles of modern surgery.

In the five years during which the standard technique has been used 77,554 open wounds have been treated, of which 97 or 0.0012 per cent became infected.

The most important conclusion to be derived from

this standardization of treatment is that the thorough cleansing of the wound with tincture of green soap and water is productive of the best results. Tincture of iodine has, however, been successfully used in the treatment of small wounds, without previous cleansing with green soap. This treatment should be instituted as soon as possible after the receipt of the injury.

ISAAC GERRER.

ASEPTIC AND ANTISEPTIC SURGERY

Bérard, L. and Lumière, A.: A Plea for the Re-establishment of Antiseptics (Essai de réhabilitation des antiseptiques). *Rev. de chir.*, 1915, *xxiv*, 289.

There has recently been a strong tendency to advocate the abandonment of antiseptics in favor of aseptic solutions which, it is held, stimulate phagocytosis and hasten physiological repair. Laboratory experiments have shown that antiseptics *in vitro* destroy white cells before they destroy bacteria, and it has been argued from this fact that they do the tissues more harm than good; but the authors hold that this conclusion is a mistake. Conditions in the living body are quite different, the leucocytes are capable of withdrawing from the toxic disinfectant and returning to the region of the wound after the antiseptic is neutralized, which takes place in a short time. And even if some leucocytes are destroyed it does good rather than harm, for their destruction causes an increased reproduction of leucocytes that more than makes up for the loss. It is on this principle that the good results of fixation abscesses are based. The authors have had excellent results from fixation abscesses produced by the injection of turpentine in 20 cases of septicæmia.

From the treatment of a large number of wounds with aseptic and antiseptic solutions and a comparison of the results the authors conclude that it would be a great mistake to abandon the use of the latter. Of course an effort should be made to get the maximum of bactericidal action with a minimum of injury to the tissues. The salts of the heavy metals, particularly mercury and silver, are the most effective bactericides, but their effect on the tissues is very toxic. Some of the chlorine compounds, especially the hypochlorites, are very effective bactericides and at the same time very harmless to the tissues. Other disinfectants, such as iodine, phenol and its derivatives, hydrogen peroxide, etc., are not so effective in their action. Therefore the best bactericides are the hypochlorites. Pure calcium chloride has been used experimentally with good results. In actual practice the authors use a solution of sodium hypochlorite neutralized with boric acid for irrigations and as a dry dressing a mixture of calcium chloride and boric acid 1:3. This solution gives off hypochlorous acid slowly, so that its disinfectant action is continuous, and it disinfects and deodorizes more deeply than any other disinfectant.

A. Goss.

ANÆSTHETICS

Booth, L. S.: A Report of the Anæsthesias in the Second Surgical Division. *Med. & Surg. Report Roosevelt Hosp.*, N. Y., 1915, p. 116.

During a period of about eleven months there were administered in all 710 anæsthesias: 471 by ether insufflation of which 348 were given intrapharyngeally and 69 intratracheally; 118 chiefly in children, by drop ether; 145 by rebreathing ether, using Bennett's inhaler; 25 nitrous oxide and oxygen anæsthesias; 17 local anæsthesias; and a few straight nitrous oxide gas anæsthesias.

The routine anæsthesia was intrapharyngeal insufflation, using the apparatus devised by Connell by which the percentage of air and ether is computed and delivered into the pharynx by rubber catheters passed through the nostrils.

The intratracheal insufflation was found indispensable in special cases, chiefly those involving the opening of the chest cavity, or where large quantities of blood flowed into the pharynx. Following the latter method there were three cases of bronchitis and there was less vomiting than with any other method. The author feels that the smoother the induction of the anæsthesia and the more rapid the disassociation of the vomiting center, the less post-anæsthetic vomiting there will be.

Preliminary morphine was not given as a routine, but it is interesting to note that the post-anæsthetic vomiting was less in this class.

There were 10 cases of post-anæsthetic pneumonia: 4 following intrapharyngeal, 4 after rebreathing, 2 after the drop method followed by intrapharyngeal insufflation.

Eight cases developed acute bronchitis: 3 following pharyngeal insufflation, 3 after intratracheal, 1 after rebreathing, and 1 after the use of the closed cone. There were 2 deaths from anæsthetics, both in bad anæsthetic risks. Eight per cent of the cases showed slight irritation of the kidneys.

The blood-pressure was elevated as a rule by ether for from five to ten minutes during the stage of excitement, then a drop to normal in full surgical anæsthesia for the first hour or so, and then a gradual fall.

D. L. DICKSON.

Hunt, C. S.: Anæsthesia in Brain Surgery. *International J. Surg.*, 1915, *xxxiii*, 372.

Hunt believes that nitrous oxide and oxygen should be used very rarely in brain work, because this anæsthesia is too superficial and uncertain in itself, without morphine or Crile's method, which does not work out well in this special field of surgery, and because of the quickness with which the reflexes may return, thus making it dangerous when the dura is opened. It also produces another undesirable condition; namely, congestion of the brain. In spinal surgery this method of anæsthesia is strongly contra-indicated, due to the posture of the patient. The nature of the operation produces a certain amount of surgical shock and the an-

aesthetist should see that he does not add any respiratory shock. Blood changes under nitrous oxide are still in doubt.

While chloroform is used quite extensively by European surgeons in brain and spinal surgery, the author finds it much more dangerous than ether. He believes that in the vast majority of cases chloroform will have to be dispensed with, due to its dangerous features.

Ethyl chloride and numerous other agents employed for general anesthesia are not to be thought of in this special branch of surgery.

Ether is more efficient than nitrous oxide and

safer than chloroform. The method used by Hunt is that of heated oxygenated ether vapor, which combination he has used in about three hundred brain cases, with much less irritation to the lungs. He uses no morphine or preliminary medication. He uses the Richardson mastoid block for brain cases in preference to sand-bags. The intratracheal method of giving ether appears to him to have no advantage over the above, and has one added danger, the tube in the larynx.

The intravenous and rectal methods are far more dangerous and are not considered as having a place in this work.

E. C. ROBITSHEK.

SURGERY OF THE HEAD AND NECK

HEAD

Evans, C. A.: Unlocalized Intracranial Injuries.

Am. J. Surg., 1913, xxix, 441.

Evans contends that it is not the fracture of the skull itself that is so important in head injuries, but rather the injury to the brain and the cranial contents. He believes the symptoms of intracranial injuries merge into one another to such an extent that often the best that can be done is to diagnose an intracranial injury, such a diagnosis being sufficient for practical purposes.

It is important that these injuries should be looked at from the viewpoint of pressure, it making no difference whether this pressure is due to a contusion, a hemorrhage, or an edema or whether or not there exists a fracture. The cerebrospinal fluid must be reckoned with in the treatment of intracranial pressure following an intracranial injury. Evans believes a lumbar puncture should be a routine procedure in every case of suspected intracranial injury.

From the viewpoint of treatment he divides these cases into localized and unlocalized injuries. For the latter class he suggests the decompression operation after the method of Cushing. Treatment must be directed toward relieving the pressure and this operation accomplishes the purpose in two ways: (1) by draining the space and (2) by removal of a portion of bone from the temporal region allowing for a certain amount of expansion of the brain and "possible accommodation to a hidden clot."

The operation is not always indicated and should not be used as a routine, as lumbar puncture or the injury itself may afford sufficient relief from pressure. Unlocalized intracranial injury is often associated with a fracture at the base of the skull, and it is here that decompression with drainage is of special value.

Since January, 1909, the author has performed the operation in 33 cases of unlocalized intracranial injuries the majority of them being cases of basal fractures. Of the 33 cases, 9 died, a mortality of 27 per cent; whereas the mortality without operation is about 50 per cent.

From his experiences Evans believes that where there is a compound fracture of the vault with an uninjured dura and evidences of a subdural clot, it is more advisable to open the dura and deal with the clot through a subtemporal opening than through an opening in the dura at the site of the injury. If there is an associated middle meningeal hemorrhage the vessel can be ligated and the clot removed through the temporal opening in 90 per cent of cases. There is no reliable guide as to which side of the skull will reveal the greater indication for opening. The sooner the operation is performed after the injury the better the prognosis. No decompression operation is complete without opening the dura and no operation is sufficient without the insertion of basal drainage.

The author cites 5 of his cases, in 2 of which it was demonstrated that if there is no improvement after a reasonable length of time after operation on one side, the other side should also be explored.

E. C. ROBITSHEK.

Gayet, G.: Surgery of Penetrating Injuries of the Skull at the Front (*La chirurgie des plaies pénétrantes du crâne par projectiles de guerre dans les ambulances immobilisées de l'avant*).

Lyon chir., 1913, xii, 618.

The absolute rule in the army corps in which Gayet has worked is to send all cases of head injury as quickly as possible to the surgical ambulances. Automobiles are sent directly to the dressing stations for them. Whatever hour of the day or night they come in they are immediately examined and operated upon. It is generally agreed that the prognosis depends very greatly upon the promptness of the operation. No matter how slight the wound may be it is opened up. Two cases are described where there was apparently only a very slight scalp wound, but when it was opened up the bone was found to be cracked. If these patients had been allowed to go without operation they would have died of meningitis.

Most of the author's operations were performed

three to six hours after the injury. The objects of operation are to control hemorrhage and prevent infection. If the dura is found normal in appearance it should be left intact; but if it is ecchymotic and does not pulsate normally it should be opened and the brain examined. No probing should be done for deep projectiles, but a careful examination should be made for superficial ones, and they should be removed.

Hemorrhage from the sinuses is controlled by tamponing, from the meningeal arteries by ligation. Deep hemorrhage is sometimes difficult to control, but it should be done by ligation rather than by pressure if possible. Gayet does not favor the use of strong antiseptics on brain tissue, but iodoform gauze may be used. This should be placed only on the surface. Drains should not be inserted in brain tissue. The first dressing should be left on forty-eight hours. Patients with brain injuries should be moved as little as possible. They should not be transported for at least two months if it is possible to keep them that long. In the meantime they may be given treatment for any paralysis or aphasia resulting from their wounds.

Gayet has operated upon 108 cases, with 100 recoveries, 76 deaths, and 12 unknown results. The cases that he calls cured were under observation for several weeks and when they were discharged the brain was completely covered in with epidermis or active granulations. He has heard from 5 of the worst cases after more than six months had elapsed, and all are alive though 2 are under treatment for slight aphasia or paralysis.

A. Goss.

Sachs, E.: Factors that Make for Better Results in Cranial Surgery. *J. Ma. St. M. Ass.*, 1913, 16, 317.

The author calls attention to a few points in the early diagnosis and in the treatment of brain lesions which he thinks make for better end-results.

The so-called cardinal symptoms of headache, choked disk, and projectile vomiting are not always the earliest symptoms; in fact they may be entirely absent. Other signs, often neglected, are of great diagnostic importance. Yawning, loss of sexual power, and cessation of menses are often early phenomena; also epileptic convulsions beginning with some sensory aura relative to sight, smell, or taste centers. Attention must also be paid to the sequence of development of symptoms.

Attention to special details is necessary in carrying out a successful operative technique in cranial surgery. A trained anesthetist and assistants are absolutely essential. Blood-pressure observations should be taken before, during, and after the operation. Proper control of hemorrhage is of great importance.

Preliminary lumbar puncture and ventricle puncture should be done in cases of excessive pressure, otherwise the brain may be ruptured on incising the dura. In all decompressive operations the dura should be left open. The wound is closed

carefully layer by layer. If the aponeurosis of the scalp is tightly closed, cerebrospinal fistulae never occur.

J. R. BOONSHAW.

Remsen, C. M.: Apoplexy: Suggestions for More Rational Methods of Dealing with Spontaneous Hemorrhage Based upon the Pathological and Physiological Factors. *Surf., Gynec. & Obst.*, 1915, xvi, 260.

Apoplexy is considered by the author as an acute pathological process associated with a more or less general intracranial physiological disturbance, rapid or gradual in its progress, which may terminate fatally, and with disturbances of function due more directly to the local effects of the lesion, such as hemiplegia, hemianopsia, and the like, possibly entirely potential at first.

A discussion of the region in which the arteries show spontaneous rupture follows, and it develops that the corpus striatum, either on its external surface or in its substance, shows the greatest prevalence of this condition. It is argued, especially from the apoplectic cases which clear up, that the hemiplegia may be entirely potential at first, and due to physiological inhibition which will lead to permanent pathological destruction should the pressure persist, together with secondary trophic degeneration. Such physiological disturbances, due to pressure, inflammatory reaction, edema, anemia, or infiltration may be entirely alleviated in many cases by the removal of the causes if this removal is consummated before the actual destruction takes place. Further, it is argued that the evacuation of the clot will prevent burrowing of the hemorrhage into the brain stalks, ventricles, and other dangerous regions. Further still, the fact that the actual cause of death is the increased intracranial pressure due to the presence of the clot and the surrounding reaction, is another argument for intervention. To avoid the paralysis and the extension of the hemorrhage means to relieve local pressure by draining the hemorrhagic cavity; the threatened death due to pressure anemia may be prevented by a simple decompression. A combination of both of these is emphasized by the author as the procedure of choice, and a decompressive opening over the surface projection of the basal ganglia is combined with an exploratory cerebrotomy, the latter performed by separating the edges of the operculum and penetrating the island an extremely short distance to the striate body. This, of course, is not necessary if the hemorrhage has worked out toward the cortex and is visible. Here, direct attack through the superficial tissue is advised.

The results of one case operated upon recently have indicated that these procedures are at least well worth further investigation, and especially early in the attack before the constant pressure upon the fibers of the internal capsule has brought about permanent changes. Brain sections show the direction of the insertion of the cerebrotomy needle and the comparative simplicity with which this procedure may be carried out.

Osler, W., Robb, G., Rolleston, H. D., and others: *Discussion on the Treatment of Cerebrospinal Meningitis. Proc. Roy. Soc. Med., 1915. ix. Therap. & Pharmacol. Sect., 1.*

IN SIR WILLIAM OSLER'S discussion of cerebrospinal fever two points are of greatest interest, prophylactic measures and the serum treatment. There is believed to be a certain value in the new conception of the disease offered by Dopter, that the epidemic is in the carrier, the meningitis itself being incidental. The germ is harbored by many who are not ill; in others it produces a mild catarrh; and in only a few cases does it reach the meninges. The two most noticeable facts connected with an epidemic are the co-relation of the seasonal prevalence with nasopharyngeal catarrh and the influence of overcrowding, the latter being the most important single factor.

As the disease has a predilection for young soldiers it is suggested that the army medical officers should, during the next winter, (1) guard the soldier against over-fatigue; (2) reduce to a minimum the circumstances which favor nasopharyngeal catarrh, such as wet, cold, and excess of tobacco; (3) combine good ventilation of the sleeping quarters with comfortable warmth.

The rational treatment of cerebrospinal fever is lumbar puncture combined with the use of serum, the latter having a specific influence on the meningococci in the spinal canal. The results with serum treatment have been unsatisfactory in many quarters. Among the Canadian troops there were 40 cases with a mortality of 63 per cent. In another group of 31 cases the mortality was 52 per cent. In Osler's opinion, the main cause has been inert sera, the strain causing the disease being "fast" to the sera used. Insufficient dosage, failure to begin treatment early and imperfect technique have, he believes, been minor contributing causes.

The two problems presented are how to prevent an outbreak during the coming winter, and if it does occur, how to keep the mortality down to the 25 per cent which may be expected under the most favorable circumstances. Experts should be appointed to investigate sera, that they may correspond to the strains of organism present in the prevailing epidemic.

ROBB, during the first seven months of a severe outbreak in Belfast, had 275 cases under his care, the death-rate being over 72 per cent. Then he received a supply of serum from America. The change in results was dramatic, the death-rate falling during the first four months to 26 per cent. Since then in no series up to last winter's epidemic had the mortality exceeded 30 per cent. He pleads that gross mortality rates be given, because in his experience it was impossible to say in the first few hours that any case was hopeless.

With the onset of the recent epidemic it was confidently thought that the death rate would be even smaller than previously because of the greater experience. The results have not been so good, however,

the mean mortality being 36 per cent. In trying to explain this several questions arose. The disease did not seem to be more virulent in type than previously; the average age had been higher in the recent outbreak, which should make for a lower mortality; comparison of several cultures from different sources with those in use in the preparation of the serum now being made at the Rockefeller Institute showed no marked differences; the immunity value of the serum used last winter, however, seemed to possess a lower standard than that formerly supplied, because of the very sudden and great demand from England. This deficiency in quantity and quality has now been corrected, and in the treatment of 8 acute cases there has been only one death, a promising result, but too small a number to judge by.

ROBB tried taking continuous blood-pressure readings but does not think he received any help from them. The alarming variations in blood-pressure may be the result of the severe pain that is sometimes experienced. The use of a general anæsthetic is recommended to avoid this. While the best dosage for either children or adults has not been worked out, yet Robb believes in giving full doses and repeating them until improvement is shown. Even to young children he has always given the full dose of 20 ccm., often more, and the results have been good.

SURGEON-GENERAL ROLLESTON reported that of 170 cases of cerebrospinal fever occurring in the Royal Navy during the first year of the present war, 54.6 per cent were fatal. In 105 cases serum was given alone or in combination with vaccines, soamin, or hexamine. Of 62 cases treated by lumbar puncture and intraspinal injection of serum 69.4 per cent died, but of those treated in addition with vaccines, soamin, or hexamine only 46.5 per cent were fatal. The failure of the antimeningococcic serum to reduce the mortality was not due to its being administered too late, for in 66.7 per cent of cases it was given within the first three days of the disease. Because of its apparent inertness intraspinal injection of serum was largely replaced toward the last by or combined with other methods. From the figures the addition of intraspinal injections of serum appear to coincide with an increase of mortality in the cases treated with soamin. In 13 cases treated with lumbar puncture alone there were 69 per cent of recoveries. The use of hexamine did not appear to have any effect clinically.

FOSTER spoke of the advantages of repeated lumbar puncture; i.e., the relief of symptoms, especially of headache. He considered it to be a very safe procedure, but one in which a general anæsthetic was advisable. No signs of collapse had ever been witnessed by him, however much fluid had come away.

GASKELL expressed the opinion that the results in this series, 39 per cent mortality in 42 cases, seemed to indicate that daily lumbar puncture with evacuation of fluid saved the patient as well as by

the giving of serum. The figures were rather scanty, however, to base a conclusion on.

CALGER reported a series of 10 cases treated, with a mortality of 10 per cent, all receiving serum, the influence of which as a curative agent, Calger strongly believes in. He also favors giving a general anesthetic for the purpose of doing lumbar puncture and has ignored the advice to observe the blood-pressure, without regretting it. His observations lead him to believe that the variations in the pulse tension and frequency were less under anesthesia.

The amount of serum usually injected was 15 to 20 ccm., usually a little less than the amount of fluid withdrawn. In some instances the injected serum had been allowed to run out and then a further quantity was injected. This intraspinal "leavage" was thought to be of benefit and worth further trial.

Care must be taken to inject slowly, allowing five minutes for the introduction of 15 to 20 ccm., but Calger believes that the risk of injecting too rapidly has been overstated. The use of chloral and bromide, in 30 gr. doses of each, every four hours was of value as a nerve sedative. In his opinion the victim of a marked attack of cerebrospinal fever is damaged physically and mentally for a long time and should not be certified for active service for at least a year.

E. K. ARMSTRONG.

NECK

Russell, C. W.: Tumors of the Carotid Body.
J. Ma. St. M. Assn., 1915, xii, 521.

The author presents a case report and a brief review of the literature based chiefly upon a previously collected series.

The embryology of the carotid gland is in dispute. The third or fourth branchial clefts, the perithelium of the carotid arteries, and the sympathetic nervous system have all been suggested as the source. The latter is most commonly believed to be the source. There is abundant nerve supply from the cranial and sympathetic nerves.

The physiology of the gland is unknown. Its presence is inconstant, and there is insufficient clinical data upon which to base opinion. The carotid body atrophies soon after puberty, and a connection with trophic stimuli of body development has been suggested.

The case presented was that of a woman 25 years of age, in whom the growth was present for 11 years. Dyspnea, painful deglutition, and nervous symptoms necessitated its removal; a preliminary ligation of all carotids on that side was necessary.

The tumor was the size of an orange, grayish-pink, lobulated, elastic, and enclosed in a distinct capsule. Histologically it was made up of large polyhedral cells divided by prolongations from the connective tissue capsule.

In all 34 cases have been reported. In 31 cases

all three carotids were ligated. A mortality of 27 per cent from all causes prevailed in the series.

J. K. BROTHMAN.

Dowd, C. N.: A Study of One Hundred and Twenty Cases of Goiter. *Med. et Surg. Report Roosevelt Hosp.*, N. Y., 1915, p. 41.

Dowd reports 120 cases of goiter, 63 of which were operated upon by the staff of the Roosevelt Hospital between January 1, 1910, and January 1, 1915, and 57 cases were operated upon by Dowd elsewhere.

The first group consisted of patients giving evidence of Graves' disease. Of these cases, 15 in all, 16 had symptomless goiter for a long time, when the characteristics of hyperthyroidism made their appearance. The average previous duration of their thyroid enlargement was six and one-third years. Hemithyroidectomy was done on all of them. All have shown definite improvement, 10 are in excellent health.

Ten had moderate symptoms of hyperthyroidism without pre-existing goiter, the average duration of which was six and eighteen months. Nine were treated by ligation of the superior thyroid arteries, and 5 by hemithyroidectomy. Two have shown moderate improvement and 7 are in excellent condition.

Twenty-nine cases showed extreme symptoms of hyperthyroidism; many of them were desperate surgical risks.

Three died after only ligation of the superior thyroid artery had been attempted, and 3 after hemithyroidectomy from edema of the lungs, one from pneumonia, and one eighteen days after operation with symptoms of profound psychic disturbance.

In far advanced cases it is better to use some form of palliative procedure until their conditions will permit of ligation or hemithyroidectomy.

Rectal anesthesia was used in some instances, preceded by morphia and atropine hypodermically, and followed in half an hour by ether and mineral oil injected into the rectum, without the patient's knowledge of the intention to operate. The mixture should be withdrawn as soon as the operator believes enough ether has been absorbed.

The post-operative results in these severe cases are: 31 showed very great improvement, 11 showed moderate improvement; 2 showed no noteworthy improvement.

The second group consisted of cases of simple goiter with pressure in which pressure or deformity were the main symptoms.

There were 40 cases, only 8 of them males, 26 were treated by enucleation of nodules or cysts, 13 by hemithyroidectomy, and in 10 instances a portion of the remaining lobe was also taken. There was no mortality.

The third group consisted of cases of carcinoma and allied conditions. There were 4 cases, 3 of which died after various periods; one patient with endothelioma was well four years after operation.

A pathological study of the cases demonstrated that those having toxic symptoms showed hyperplasia regularly. This sometimes seemed almost uniform throughout the gland, but sometimes was associated with colloid formation. Cases of the latter type are most difficult to interpret as to whether they are in a state of regression or whether there is a degree of regeneration. D. L. DESPARD.

Schlagenhauser: Tumors of the Parathyroids (Parathyroideatumoren). *Wien. klin. Wochenschr.*, 1915, xxviii, 1362.

Schlagenhauser demonstrated two cases of tumors of the parathyroids before the medical society of Vienna. One was in a 43-year-old man who had had osteomalacia for five years, while the base of the skull showed changes resembling those of osteitis fibrosa. The left lower parathyroid was the size of a plum; histologically it was almost normal. The other patient was a 62-year-old woman who had had osteomalacia for 15 years. The right lower parathyroid was the size of an almond. Histologically it too was almost normal. The author recommended operative removal of hyperplastic parathyroids.

In the discussion MARESCH said that he had performed autopsies in 23 cases of malacia of the bones. In 10 cases of osteomalacia in women from 58 to 82 the parathyroids were only moderately enlarged, or had merely not atrophied as had the other parenchymatous organs, thus showing a relative enlargement; but there was no pronounced parathyroid tumor in any of these cases. Five cases of severe osteitis deformans (Paget) of the skull with varying degrees of involvement of other parts of the skeleton,

two cases of Paget's disease of the tibia and one of the right femur did not show parathyroid tumor, nor did two peculiar cases of bone disease of unknown nature combined with dwarfism. There were only three cases that showed parathyroid tumors: one a case of severe typical osteitis fibrosa with multiple fractures, cysts, and tumors, in which the parathyroid was the size of a chestnut; one a case of malacia with pronounced curvature of the femurs in which the one parathyroid was the size of an almond; and one with a parathyroid also about the size of an almond and malacia of the whole skeleton with multiple cysts of various long bones. This shows that malacia of bones is by no means always associated with parathyroid tumors, and the nature of the relation between these tumors and bone disease is by no means understood, but as no other known treatment is effective in these conditions and the removal of the enlarged parathyroid does no harm, Maresch agrees with Schlagenhauser in advising surgical removal.

BAUER pointed out that osteomalacia is frequently associated with tetany. Tetany is a sign of parathyroid insufficiency and it may be that these adenomatous parathyroids are defective in function; in that case a further removal of parathyroid tissue would be injurious. Moreover adenomata of the parathyroid are found in individuals who have no bone disease of any kind, while on the other hand there are cases of osteomalacia associated with disorders of other glands; for instance, the female sexual glands, the thyroid, and the hypophysis. The pathogenesis of osteomalacia is very complex and not well enough understood to furnish indications for surgical intervention. A. Goss.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Fort, F. T.: Injuries of the Chest. *Am. J. Surg.*, 1915, xxix, 305.

A good clinical division of chest-wall injuries is into penetrating and non-penetrating. Punctured wounds include those where the depth of the wound is greater than the diameter of the opening. The X-ray often must be used to differentiate between periosteal bruising and rib fracture. Traumatic pneumonia often follows contused wounds of the chest and is probably due to pneumococcus activity at a point of lowered resistance.

The treatment of non-penetrating wounds consists in the use of cleanly measures, using tincture of iodine and, if necessary, a few stitches and drainage. Should the injury be received around a stable, paint the wound with phenol and administer 5 ccm. of antitetanic serum. Simple contused wounds and fractures are best treated by the application of adhesive plaster.

"Commotio thoracica" is the name given to a

severe chest injury resembling contusion or laceration of the brain. Sudden death from shock may follow, without any demonstrable lesion post-mortem.

The fifth and sixth ribs are those most frequently broken, usually at one or the other end. When in doubt whether a fracture exists or not, if there is intense pain at the end of inspiration or on turning in bed and if the respirations are hurried, a fracture may be assumed. Fractures of the sternum are rare and if impossible of reduction, operative interference is necessary only when the displaced part, usually the manubrium, is causing serious pressure symptoms. About one per cent of all fractures involve the scapula. A positive diagnosis is not always easy. In compound fracture of this bone the comminuted portions, if present, should be removed to permit drainage of infectious material. Fracture of the clavicle is treated by carrying the arm upward and backward, employing the four-tail bandage of Sayre's adhesive plaster dressing. Dislocation of the clavicle is commonest at the sternal end and is

sometimes difficult to reduce. A figure-of-eight or plaster-of-Paris bandage may be used to retain the bone in place. In dislocation of the acromial end wiring may be tried if an adhesive dressing fails to maintain position.

Penetrating wounds of the thorax may be followed by hemothorax, emphysema, pneumothorax, or hemothorax, and some days later by pneumonia, abscess, bronchitis, gangrene, or hernia of the lung. Emphysema frequently accompanies injury to the lung substance by a broken rib, but sometimes air rushes into the pleura, compressing the lung and causing intense dyspnea. This may be relieved by passing a trocar into the pleural cavity, thus allowing the air to escape. When free hemorrhage accompanies chest injuries the advisability of opening the wound, evacuating the clots, and searching for the bleeding vessels must be considered. Usually the condition is so serious that interference is not warranted.

Injuries to the great vessels are usually fatal but wounds of the pulmonary vessels and of the aorta have been successfully sutured. Differential pressure and insufflation are by no means necessary for the performance of thoracotomy but they are usually of advantage, respiratory and circulatory disturbances from acute pneumothorax being thus avoided. After operation the chest wound may be completely closed without risk of pneumothorax and subsequent infection.

Traumatic hernia of the lung is uncommon. If left undisturbed strangulation, gangrene, and sloughing occur, usually with satisfactory healing. Chest injuries in the precordial region may involve the pericardium alone or may penetrate the heart wall. The great vessels may also be injured. The treatment of cardiac wounds comprises absolute rest; an ice bag applied to the chest; morphine for pain; evacuation of blood in the pericardium. The latter procedure should be by open operation in order to avoid injury to the pleura or heart and to enable the bleeding point to be secured. A wound of the heart wall should be closed with fine silk sutures. Collected statistics show a recovery from heart wounds ranging from 13 to 38 per cent. More than 60 per cent of those who died succumbed to secondary causes, usually infection. E. K. ARMSTRONG.

Taylor, K.: Frequency of Chest Complications Among the Wounded. *Ann. Surg., Phila.*, 1915, *lxi*, 379.

In view of the frequent occurrence of pathological lung conditions revealed at routine autopsies in the American Hospital of Paris, it was decided to review the total number of autopsies on record with the idea of ascertaining the frequency of pathological conditions of the lungs and pleura among the fatal cases.

Fifty-one autopsy reports were examined. Many of the cases presented several pathological conditions, and an attempt was made to classify the injuries.

The cases in which pathological lung conditions are certainly to be expected are, of course, those in which there is a penetrating wound of the chest and probably also the high transverse lesions of the cord which together comprise 9 of the 43 cases showing pathological conditions. This leaves a total of 31 cases out of 51 autopsies in which the lung condition seemed to bear no direct relation to the wound. Some of these, especially a few of the acute bronchopneumonias, are undoubtedly to be explained as part of a general pyemia or septicemia. On the other hand, there is left a large proportion of cases in which it is difficult to see any direct relation between the wound and the condition in the chest. The frequent occurrence of lung conditions in wounds of the thigh, 16 out of 17, 94 per cent, as in penetrating wounds of the abdomen, 4 out of 5, and in transverse lesions of the cord, 4 out of 4, suggests that the chronic degenerative change manifested in the great number of adherent pleura may possibly be connected with the matter of posture as well as the general intoxication from the wound itself. E. H. POST.

Powers, C. A.: Senile Parenchymatous Hypertrophy of the Breast. *Am. J. Surg.*, 1915, *xxix*, 446.

The author describes the variations in the pathology of this condition, sometimes known as subnormal involution, or multiple cystic disease of the breast. The pre-operative diagnosis is often uncertain, and the operation is usually exploratory.

Powers believes the proper treatment to be a thorough removal of the affected breast. He uses the curved incision at the outer, lower margin of the breast, everts it, and carefully examines the breast from behind. It can also be removed this way, and in many cases by leaving the nipple behind the contour of the parts can be fairly well rehabilitated.

Seventeen breasts affected with this disease have been removed by the author from fourteen women. In every case, the breast was thoroughly examined by a pathologist, but in none of the cases was any evidence of cancer found.

This appears to be contrary to the experience of most other surgeons, who have found from 25 to 50 per cent of these cases already malignant. The author does not attempt to reconcile these facts, but accepts and firmly believes the general statement that cancer is to be expected in a very considerable proportion of all cases, and that this renders imperative the early and thorough removal of the affected breasts. ISAAC GERBER.

Elberg, C. A.: The Abdominal Skin-Flap in Radical Amputation of the Breast. *Ann. Surg., Phila.*, 1915, *lxi*, 615.

The possibility of being unable to close the wound after breast amputation should never be a determining factor as to the amount of skin to be removed. Radical removal of the disease may necessitate the

removal of so much skin that the wound cannot be closed by any of the present plastic operations and skin-grafting becomes necessary.

The author has used with success a large skin-flap from the abdomen. The skin of the abdomen receives abundant blood supply and if the base is not too small there is no danger of sloughing. The size and shape of the flap will depend upon the requirements of the individual case. A large amount may be used and the abdominal wall closed without much tension.

J. R. BUCHENDER.

Beebe, E. L.: A Case of Complete Dislocation of the Outer Extremity of the Clavicle. *Buffalo M. J.*, 1915, lxxi, 238.

The author reports the case of a chauffeur, who was injured when the heavy touring car he was driving capsize. The edge of the body came down on the right shoulder, striking just below the acromion process. The outer end of the clavicle was forced upward over the acromion process. All the ligaments uniting the clavicle to the scapula were torn. The outer extremity of the clavicle was elevated to make a marked prominence. Reduction was accomplished by traction while the end of the clavicle was pressed into place. An attempt was made to maintain the reduction by Stimson's apparatus, which would have been sufficient in case of incomplete dislocation. In this case when the patient moved about or resumed the upright position the dislocation soon recurred. Therefore an operation was decided upon. Through a transverse four-inch incision the joint was cleared out and the dislocation reduced. A point half an inch from the articular surface was selected and a hole drilled in each bone. Here the margin of the acromion and the clavicle approach one another at an acute angle. A copper wire of rather large gauge was introduced to form a figure-of-eight, which prevented the bones from overriding one another.

There was no recurrence of the deformity. The wound healed promptly, and motion was allowed after three weeks. The patient soon resumed his occupation with complete use of the shoulder. There was no pain or limitation of motion. There was some tenderness on pressure where the suture entered the bones.

Points of advantage in this method are: the small exposure required, ease of execution, and the joint not being invaded.

A. GOSS.

Sachs, T. B.: Artificial Pneumothorax in the Treatment of Pulmonary Tuberculosis; Results Obtained by Twenty-four American Observers. *J. Am. M. Ass.*, 1915, lxx, 1861.

In an analysis of 1,145 cases of pulmonary tuberculosis treated by gas compression by 24 American observers, Sachs finds the following interesting data.

Of a total of 1,145 cases reported in the American literature in the last three years, the stage of the disease was given in 1,028 cases; of this number 88.7 per cent were in the far advanced stages; 10.6 per cent were moderately advanced; 0.7 per cent were in the incipient stage. The reports include 5 cases of bronchiectasis, 5 of pulmonary abscess, and 1 of tumor.

The side involved was designated in 897 cases; bilateral involvement was present in 77 per cent; unilateral in 23 per cent. The presence or absence of cavities was given in 606 cases; of this number, cavities were present in 62 per cent. Tuberculous complications (larynx, bowel, empyema, etc.) were present in 112 cases, or 23 per cent, out of a total of 489 cases in which the presence or absence of complications was recorded.

It is apparent, the author says, that artificial pneumothorax is being tried at present in this country chiefly in very advanced cases unimprovable under ordinary sanitarium régime. This must be taken into consideration in judging the "immediate" and "subsequent" results obtained in the 1,145 cases analyzed.

The degree of compression obtained in individual cases is given in 757 cases; satisfactory compression, 51.5 per cent; partial, 27 per cent; failure, 21.5 per cent.

The "immediate" results of treatment were as follows: failure, unimproved and dead, 49.1 per cent; improved, 29.2 per cent; quiescent, 10.8; apparently arrested, 9.5; cured, 1.4 per cent. The subsequent results are given in 76 re-expansion cases (out of a total of 447), in which re-expansion existed from a few months to 7 years, the durable results of treatment being represented by a total of 12.3 per cent of quiescent, arrested and cured cases.

The author believes that it may be a conservative estimate to say that, with the present technique and the class of cases treated, the percentage of durable results (arrests or cures) is about 12 per cent, while in more than double this number, a palliative effect is produced, which is of variable duration. The sum total is a distinct increase of the chances of the advanced cases which do not respond to the usual methods of treatment.

An analysis is given of the dangers and complications incident to the production of artificial pneumothorax, such as gas embolism, pleural reflex, pleural effusion, etc.

In conclusion, the author states that experience with artificial pneumothorax in the treatment of pulmonary tuberculosis is gradually modifying the sphere of its application. The trend is toward its use, regardless of stage, in all progressive cases (particularly with unilateral involvement) which fail after sufficient trial to respond to strict sanitarium régime. In the interest of safety and best results, the treatment in the majority of individual cases should be applied, at least during the first few months, in a hospital or sanitarium.

Through improvement of various details of tech-

nique and greater conservatism of action, pneumothorax therapy, according to the author, is gradually finding its defined place in the treatment of cases of pulmonary tuberculosis which do not yield to other methods.

Rémond, E., and Glénard, R.: Penetrating Wounds of the Thorax (Plaies pénétrantes de poitrine). *Paris méd.*, 1915, V, 459.

The authors are stationed in a hospital about 30 kilometers from the firing line. In the five months they have been there they have treated 1,850 wounded men, 150 of them being wounds of the thorax, in 110 of which the projectiles penetrated the thoracic wall. About three-fourths of these patients had hemothysis, a much higher percentage than is given by most authors, but absence of hemothysis does not necessarily mean that the lung is uninjured. Twelve of their patients died, but in 6 of them there were severe complications, leaving only 6 fatalities from the pulmonary wound alone.

As they were in danger of having to move their quarters at any time they could not establish an X-ray room, but there was an X-ray carriage that could be summoned and reach them within twenty-four hours, so that they were able to locate the projectiles in a number of cases and extract them if superficial. The lung complications that they encountered were prolonged hemothysis, hemothorax, purulent pleurisy, pulmonary congestion, bronchopneumonia, simple bronchitis, and abscess of the lung. Aside from the lung complications there were 6 cases of subcutaneous emphysema, 3 cases of paralysis of the arm from injury of the brachial plexus, and a number of cases of abdominal injury and fractures of various bones.

The first essential in treatment is to place the patient at rest as quickly and completely as possible. The authors' patients were placed in large, well-aired rooms, not more than two in a room, and they were cared for in their beds to avoid moving them to the central dressing room that was used for other kinds of wounds. No probing should be done for deep-seated projectiles, as the lung tolerates their presence very well, and there is danger of both infection and hemorrhage from probing.

The general treatment for hemothorax is expectant; puncture should be done only when the volume of the effusion threatens serious complications or when it shows signs of becoming purulent. Such operations as ligation of intrathoracic vessels, suture of the lung, and extraction of deep projectiles are too serious to be undertaken at the hospitals at the front. The only operation that has to be performed quite frequently is rib resection for empyema. If a hemothorax is accompanied by persistent fever an exploratory puncture should be made and if pus is found operation performed at once. Patients with injuries of the lung should not be transported for at least eight days, even though they are apparently well. One patient was sent away after five days and he died of secondary hemorrhage when he

reached the hospital in the interior. Some of the patients were obliged to stay as long as forty days. A. Goss.

Gerhardt, D.: Pleurisy After Gunshot Injuries of the Thorax (Ueber Pleuritis nach Brustschüssen). *München med. Wochenschr.*, 1915, LIII, 1693.

After gunshot injuries of the thorax in addition to the hemothorax a serous pleuritis often develops. A few days after the injury the dullness is no longer caused by the hemothorax alone, but perhaps the greater part of it is caused by the serous exudate. This secondary pleurisy is the most frequent cause of cases of lung continued fever, which, however, generally subside spontaneously as the exudate is absorbed. The clinical course is about the same as that of pleurisy from other causes except that the absorption frequently takes a longer time and so the fever continues longer. For the first week it is dangerous to puncture for fear of causing renewed hemorrhage; but after that puncture may be done, and if there is marked dyspnea it should be done without fear, for the fluid is generally found to be more serous exudate than blood.

In the further course of these stubborn exudates it is important that they should be punctured, for if the lung is prevented from expanding for a long time there is danger of chronic pneumonia, and bronchiectasis. At first not more than 150 to 300 ccm. of fluid should be withdrawn, but after the danger of secondary hemorrhage has passed as much as a liter to a liter and a half may be withdrawn. The puncture should be supplemented by respiratory gymnastics. A. Goss.

TRACHEA AND LUNGS

Kofler, K., and Fruehwald, V.: Gunshot Wounds of the Larynx and Trachea (Schussverletzungen des Larynx und der Trachea). *Wien klin. Wochenschr.*, 1915, XXVIII, 1337.

The authors give the histories of 1 case of injury of the trachea and 16 cases of injury of the larynx which they have had occasion to treat in their hospital in the home zone. A table is given showing the treatment and results in each case. The symptoms that immediately follow a wound of the larynx are more or less severe bleeding and the expectoration of blood for several days, and in some cases emphysema of the skin; varying degrees of hoarseness to complete aphonia and in many cases increasing difficulty in breathing. Sometimes there is loss of consciousness and difficulty in swallowing. The only symptom that demands immediate attention in the field is difficulty in breathing for which the field surgeon often has to do tracheotomy or synglosotomy. Among the authors' cases each of these operations had been performed twice.

The symptoms the patients complained of in the home hospital were purulent rhinitis, smooth or nodular swellings in the larynx, scars and cicatricial ad-

hesions in the form of weblike membranes, in one case a hematoma that recovered spontaneously and speech difficulties due to nervous or inflammatory changes of the cords. Treatment in most cases was expectant in the hope that the condition would improve with the discharge of necrotic bits of cartilage. This often occurs in civil practice. In one case the findings in the larynx and the voice did improve markedly after bits of cartilage were coughed up. The danger that such bits of cartilage may fall into a bronchus or be aspirated is slight. In three cases exuberant granulations were removed with sharp forceps, resulting in improvement in breathing and speech. Three cases were dilated with bougies or dilators, with the result that one could have his tube removed and be discharged with normal breathing and speech, while the other two are still under treatment. In one case an adhesion of the subglottic space was removed after which the laryngeal findings became completely normal. Inhalations and electricity were utilized as aids in treatment.

Of the 6 patients who had tracheotomy or syndesmotomy performed, only 2 still wear the tubes, while the other 4 have recovered sufficiently to have them removed. The results so far as the voice was concerned were good in 8 cases, though some of these were very severe injuries. In some cases the patients remained aphonic, while in one case the voice became deeper and in one case speech demands considerable effort.

A. Goss.

Volkman, J.: Gunshot Injuries of the Lung (Lungenschussel). *Deutsche med. Wochenschr.*, 1915, lii, 1415.

Volkman reported 93 cases of gunshot injury of the lungs at the meeting of the Stuttgart medical society devoted to military surgery; 6 of these died, a mortality of 6.6 per cent. Two of these, however, were complicated by severe injuries of the spinal cord, so that the deaths due to the lung injury were only 4.3 per cent. The causes of death in the infected cases are empyema and pneumonia, in the non-infected ones secondary hemorrhage and pneumothorax. Treatment consists of rest in bed and placing the injured side at rest with adhesive plaster strips; morphine and codeine given internally.

Hemothorax may be treated conservatively or punctured; not before the tenth to fourteenth day, and then every ten days, not more than 75 to 100 ccm. being removed. If there are pressure symptoms from the fluid 500 ccm. and more may be removed; if there is hemorrhage from the intercostal artery, tamponing should be done. If there is slowly rising fever empyema is suspected. Punctures should be made at different places, and if pus is found, resection should be performed. A closed pneumothorax is left alone or the air is removed by suction, an open one is closed if possible. The after-treatment consists of breathing exercises and gymnastics.

The patients should be watched and they should be advised to change their occupation if it makes any great demands on their lungs, as for instance trumpeters and mountaineers. Volkman is unable as yet to decide whether the more radical treatment that has been practiced recently gives better results than the conservative treatment formerly in vogue.

A. Goss.

Rieder, H.: Gunshot Wounds of the Lungs and Tuberculosis (Lungenschussel und Lungentuberkulose). *Muenchen. med. Wochenschr.*, 1915, lvi, 1467.

The prognosis of gunshot wounds of the lungs is comparatively good so far as immediate recovery is concerned, but there is no doubt that they leave the lung with a decreased functional capacity that tends to favor the development of tuberculosis later. There is no proof that there is such a thing as true traumatic tuberculosis. But existing cases of tuberculosis grow worse and a latent process, which perhaps the patient never knew of, may be awakened into activity by trauma. Roentgen examination often shows the presence of such an old tuberculosis in cases where it had not been clinically evident.

The prognosis in post-traumatic tuberculosis is always grave. In order to prevent it patients after gunshot wounds of the lungs should be given a period of heliotherapy or sanitarium treatment. They should be protected as far as possible from contact with infection, should be given respiratory gymnastics for several weeks after the injury, and for several months periodical examinations should be made of the lungs, even when there are no symptoms.

A. Goss.

HEART AND VASCULAR SYSTEM

Rhodes, G. B.: Suppurative Pericarditis. *Ann. Surg.*, Phila., 1915, lvi, 660.

Based upon a review of the literature, the author presents a discussion of the diagnosis and treatment of suppurative pericarditis. To the 73 cases already collected by Eliot in 1909 he adds 11 cases from the literature and 2 of his own.

About two-thirds of the cases occur in adults. The pneumococcus is the most common organism in infants; in older children and in adults the staphylococcus and the streptococcus seem to be the prevailing causative organisms. Almost any other organism may be causative.

There are three arbitrary stages to the lesion. In the first there is a slight effusion without physical signs, leucocytosis, and constitutional phenomena alone giving evidence of trouble.

In the second the sac is distended to the limits of normal elasticity, and this is the stage in which physical signs are ordinarily first observed.

In the third there is great overdistention; to this stage Rehn has applied the name of *Herzdruck*. As this stage develops the patient shows great respiratory embarrassment and cyanosis. There may be orthopnea, pericardial pain, edema of the

upper thorax, and in some cases pain and rigidity in the upper left abdomen. An irregular pulse is common and is due usually to great overdistention. The pulse becomes normal when tension is relieved. The heart is usually forced against the chest wall anterior to the exudate, though numerous cases including those of the author showed fluid between the heart and anterior wall. The leucocyte count runs high, 30,000 to 35,000. The X-ray is especially valuable in early cases where the condition may simulate aneurism or purulent mediastinitis.

Exploratory aspiration is strongly condemned; cases aspirated always die. The needle usually traverses normal pleura in entering the pus sac, and a fatal pleural empyema results. The heart may easily be punctured; the exudate may be too thick to pass through the needle. Moreover, aspiration as a diagnostic aid is unnecessary, the X-ray, leucocytosis, and temperature chart being sufficient.

Cases submitted to early operation afford hope of recovery if no previous aspiration has been done. Complications such as pleural empyema, pyemia, sepsis, and pneumonia are the usual causes of death. In the 80 collected cases the mortality was 47.7 per cent.

For treatment the author advises the formation of a skin flap and resection of the seventh costal cartilage as suggested by Mintz in 1903. The exudate should not be allowed to escape too rapidly because of the danger in suddenly lowering intrapericardial tension. Free drainage must be maintained for a considerable length of time. The action of the heart makes this very difficult to accomplish. The author

suggests the use of rubber tissue rather than rubber tubing because of the danger of pressure necrosis. In his cases he irrigated daily and replaced the drainage in each sinus of the sac. Autopsy showed that this method provided efficient drainage.

J. R. HENNINGS.

PHARYNX AND OESOPHAGUS

Finkelstone, B. B., and Ellis, T. L.: Report of a Case of Oesophagotracheal Fistula. *J. Am. M. Ass.*, 1915, LV, 2115.

There are two forms of congenital occlusions of the oesophagus: one in which the upper and lower portions of the occluded oesophagus are connected by a fibrous cord, and the other in which the lower portion opens into the trachea or one of the bronchi. The case reported belongs to the latter class.

The earliest symptoms were vomiting in an apparently healthy infant; accumulation of mucus in the throat with gagging and asphyxiation; and coughing and choking immediately upon the ingestion of food.

No operation was attempted as gastrostomy seems of no avail, since any milk introduced into the stomach is apt to be discharged into the trachea.

The necropsy showed a communication between the oesophagus and the trachea at the third tracheal ring from the bifurcation. The oesophagus was obliterated from the third to the fifth tracheal ring. Distal to the fistula the oesophagus extended in a normal condition to the stomach. J. H. SKIFF.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Funk, V. A.: Surgical Tuberculosis of the Abdominal Cavity. *J. Indiana St. M. Ass.*, 1915, VII, 545.

While tuberculosis of the abdominal cavity is no longer a clinical entity, the very frequent impossibility of determining which organ is involved makes this a possible term covering a general symptom group.

The strongholds of this disease are: the pelvic organs, the appendix, the mesenteric glands, the intestines, and the peritoneum itself. The stomach is fairly immune to this type of infection, but Rovsing is quoted as believing it not improbable that no small percentage of pyloric stenoses and ulcers of the stomach are of tubercular origin. The Peyer patches afford good lodgment for the infection, but whether it be primary in these structures or in the intestines is a mooted question. Ravenel collected over 400 cases which were unmistakably primary in the intestine, the larger part of which occurred in the ileocecal region. Lockwood claims that 2 per cent of all cases of appendicitis are tuber-

cular. Louis was the first to recognize and interpret the possibility of many of the peritonitis cases having a tubercular origin. By accident Wells in 1862 operated on a localized tubercular peritonitis, thus unwittingly laying the foundation for many cures which have followed.

In operating on these cases if the primary focus of the disease can easily be removed it is advisable to do so though the opening of the abdomen alone frequently suffices; but whether tuberculin or the X-ray is to be used in conjunction with or instead of the surgical measures in any particular case the physician must use tact and skill in the choice and carrying out of any method. C. D. HENRIK.

Kauch: Gunshot Wounds of the Abdomen in the Field (Ueber Bauchschüsse im Felde). *Ber. Mon. Wehrsch.*, 1915, III, 1321.

The majority of military surgeons at present hold that gunshot injuries should be operated on in the trench warfare if they are received within the first eight to twelve hours, if they can be operated upon under aseptic conditions, and if operating upon them does not necessitate putting off other more hopeful

cases, but most surgeons advise against operation when the armies are advancing or retreating. This was the position taken at the Congress of Military Surgeons in Brussels. Only Enderlen and Sauerbruch advised operation while the armies were in motion.

Kausch has worked in Belgium, France, Galicia, and Russian Poland, so that he has had experience under the most varied conditions. He advises operation in all cases of intestinal perforation, no matter whether the armies are entrenched or on the march. Most cases are not in a condition to be operated upon after twelve hours, but he has seen cases saved after twenty hours. While the prognosis is quite bad even after operation, cases are saved that would have been lost without it, and he has never seen a case die after operation that had a chance of recovery under expectant treatment. In a series of 7 cases with very bad intestinal wounds he saved 3, even under the extremely bad conditions that exist at the Eastern front. Here where the sanitary conditions are so bad even an exploratory incision offers considerable danger, and it is not always possible to make a diagnosis as to whether the intestine is injured or not. He has found that when the intestine is injured and even the slightest opening is made in the peritoneum, air is discharged through the opening. So he makes a very small skin incision and only the tiniest incision in the peritoneum, in case the diagnosis cannot be made otherwise. If air is discharged he proceeds with the operation; if not the patient is not subjected to an operation, or even an incision that is large enough to involve any danger, and time is not lost that might be given to other cases.

A. GOSS.

Quénu, E.: Treatment of Gunshot Injuries of the Abdomen (Du traitement des plaies de l'abdomen par projectiles de guerre). *Rev. de chir.*, 1915, xxxiv, 219.

Quénu has previously published statistics collected from various sources in an endeavor to determine the mortality from abdominal wounds under expectant treatment. But he found that the percentages of recovery given in different series of cases varied from 0 to 100 per cent, and that the descriptions of the cases were so indefinite that he could not tell whether the wounds were penetrating or non-penetrating. In the present article, instead of taking statistics from the front, he reports 62 cases sent back from the hospitals at the front to Paris. He himself has seen all the cases except three reported to him by his friend Walther. Of the wounds 38 were found on examination to be non-penetrating, though they were marked penetrating on the tags attached to them.

Quénu points out that a wound cannot properly be called penetrating unless the peritoneal cavity is opened. An injury of the kidney, the rectum, or the extraperitoneal part of the colon is not penetrating, though it is generally so labeled. Some of these men had been operated on before being sent

back, and 5 were doubtful as to penetration, so there remain only 18 penetrating wounds evacuated without operation. The majority of the simple penetrating wounds, that is, those in which the peritoneum had been opened but no viscus injured, showed a hernia of the omentum through the wound, which ought certainly to have been operated on at the front if it were at all possible. Three of the patients with intestinal wounds arrived in such a serious condition that they died in a few days and another died on the way.

Of the 14 remaining cases of penetrating wounds one had to have an emergency operation for peritonitis caused by gangrene of the eviscerated omentum; a second had to be operated on for peritonitis and intestinal occlusion; and a third for subphrenic abscess complicating liver abscess, which leaves only 11 cases. Of these, 5 were simple penetrating wounds. There were only 6 visceral wounds, and one of them was only a probable wound of the stomach, 3 others were slight injuries of the liver at a distance from the hilus, and the 2 cases of intestinal injury were posterior injuries of the colon and the opening in the peritoneum had been filled by visceral adhesions, so that they were exceptionally favorable cases.

Quénu thinks that the study of these cases is an indirect but important argument in favor of operative treatment of abdominal injuries at the front.

A. GOSS.

Deaver, J. B., and Pfeiffer, D. B.: Peritonitis. *N. Y. M. J.*, 1915, cii, 977.

A proper understanding of peritonitis implies a thorough familiarity not only with the peritoneum, its anatomy, pathological physiology and bacteriology, but also with the diseases that give rise to it, and successful treatment can be based only on the most thorough understanding, for there is no rule of thumb which can be applied to such a protean condition.

The pathology, prognosis, and treatment are discussed.

The authors are convinced that if cases of peritonitis were given the benefit of proper preliminary treatment by the physician in charge, practically the only mortality would be in the few cases which were denied the obvious need of surgical drainage of pus collections and those unfortunate enough to be subjects of a type of infection that no resources of medicine or surgery can control.

The bacteriology of peritonitis has much to do with its outcome. The possible infecting microorganisms almost run the gamut of the pathogenic bacteria. Most dreaded is the streptococcus.

Whatever the bacteriology of the infection, our position is simply this—that when there is adequate reason to suspect pneumococcal peritonitis, we should the more willingly delay operation until the stormy symptoms subside, if they do subside, and, in the light of operative results in the same group of

cases, a fatal outcome would not cause us to regret not having operated precipitately.

Clinically considered, peritonitis arises in almost every instance from one of four regions: the appendix, the pelvic organs, the pyloric region, and the gall bladder. Many special causes exist, but if we confine ourselves to the organs mentioned, we shall have considered the major portion of the subject. The recognition of peritonitis secondary to disease of one of these organs is not often a matter of great difficulty if sufficient care is taken to make a careful examination. Everyone is familiar with the classical picture of peritonitis, but in this, as in so many other conditions, we are still shackled by the great but ancient masters of clinical description. That which results in peritonitis is early recognition, and the classical picture is not that of an early, but an advanced, stage of the disease. The sign which has been most reliable is rigidity. We are always suspicious of increased tension of a portion of the abdominal musculature. If definite rigidity, spasm, and tenderness are present, it is pretty safe to assume that some disease is present which has gone so far as to involve the peritoneum. The existence of symptoms indicating that an inflammatory process is going on within the body, such as fever, increased pulse-rate, and leucocytosis, is helpful but not essential.

The prognosis in peritonitis is influenced chiefly by: (1) the type and degree of the infection, (2) the situation of the infection, (3) the time of operation, (4) the operation itself, (5) the pre-operative treatment, and (6) the post-operative treatment.

As to the operation itself, the first function of the surgeon is to decide whether and when it should be done. It is at this point that physicians and surgeons should meet. The prevalent practice of calling the surgeon only when it has been decided that operation should be performed has many disadvantages. It causes delay in cases that should be operated upon promptly and, on the other hand, it causes surgeons embarrassing experiences dodging operations that physicians have concluded were necessary and so informed the patient. More surgical consultations without the necessary inference of operation would improve many of our results.

It is impossible to lay down a general rule in all cases, but it may be said that it is seldom possible to act too quickly in peritonitis caused by the appendix or by a perforated gastric or duodenal ulcer, while in peritonitis of pelvic origin delay should be the rule. Peritonitis of rapid spreading character seldom comes from the gall-bladder. When present it is usually due to perforation, and it demands quick action. In the more common type limited to the adjacent structures, the mortality and results of operation are better if time is allowed for subsidence of the acute condition.

Another important rule in the presence of acute peritonitis is to do the least that is consistent with the ends of operation and in the shortest time compatible with good work. There is one exception to

this rule; namely, the performance of a gastro-enterostomy at the same time as the closure of a perforated gastric or duodenal ulcer.

As to the post operative treatment, the slogan should be "let him get well." If the operation is properly timed and well executed, there will be little to do and the less done the better. A sharp watch must be kept for complications and symptomatic treatment given for individual conditions as they may arise, but of routine measures there is little to say. The sitting posture, enteroclysis, nothing by mouth, and careful nursing are the important factors. Water, hot or cold, or crushed ice is used when peristalsis begins, as evidenced by the passage of flatus or staining of the fluid in the enteroclysis reservoir. Nausea, vomiting, and persistent regurgitation, or excessive upper abdominal distention or tympany call for the stomach tube.

EDWARD L. CORNELL.

Doerfler, H.: Symptomatology and Treatment of Pneumoperitonitis (Beitrag zur Symptomatologie und Therapie der Pneumoperitonitis). *Munchen med. Wochenschr.*, 1915, Juli, 1754.

There is a form of infectious peritonitis in which gas collects in the free abdominal cavity outside the intestine, but it is so rare that it is scarcely touched upon in the textbooks. Doerfler reports a case in a 44-year-old man who had been operated upon for scrotal hernia. After the operation signs of subacute peritonitis developed. The bowels moved but the distention of the abdomen was not reduced by the passage of gas. The distention was so great that it interfered seriously with the movements of the diaphragm, but the patient's general condition and pulse remained good for three weeks and there was no vomiting. Repeated punctures were made but finally the patient died of septic peritonitis.

On autopsy an encapsulated focus of peritonitis was found in the upper abdomen that could doubtless have been evacuated if the abdomen had been opened up, and thus the patient's life saved. The peritonitis seemed to have originated in the stump of the omentum which had been resected during the operation. The infection was evidently due to a gas-forming bacillus, probably the bacillus aerogenes capsulatus, which may have gained entrance with the catgut during the operation. Doerfler publishes the case with the purpose of drawing attention to the possibility of such a pneumoperitonitis and to emphasize the fact that laparotomy is indicated.

A. Goss.

Crisler, J. A.: A Further Study in the Use of Iodine in Combating the Peritonitides. *Tr. Socia. Surg. & Gynec. Am., Cincinnati*, 1915, Dec.

Crisler states that surgeons of lesser note have automatically inherited the more virulent cases of peritoneal infections, since the great teachers of surgery and the better clinics, especially of the North and East have, of necessity, rightly divorced themselves from every poor case possible.

He uses a two and one-half per cent solution of iodine crystals in ninety five per cent alcohol, and as soon as the incision is made and the cavity reached, if pus is discovered in the peritoneal cavity, this solution is poured in immediately so as to thoroughly flood the infected area before any attempt is made to liberate the pathological tissue. With this method there is no danger of spreading the infection through mechanical means. The principal feature in this method up to the present has been to make perfectly sure that the iodine reaches well beyond the areas infected and also that the operation is being done in an immersed field, from which no further contamination can reach the healthy portions without first coming in contact with the solution. The amount of the solution used is dependent upon the extent of peritoneal infection; that is to say, if the infection is partially or completely localized, two or more ounces may be sufficient to flood the field and render the necessary service. It, however, there is a wide spread of infection as in diffuse, septic peritonitis, the abdominal incision is retracted and elevated and the entire abdomen and pelvis literally filled with this solution, great care being taken to make sure that the drug reaches all of the fossae and recesses within the abdominal and pelvic cavities. This may require from eight to thirty two ounces or more of the solution. After the focus of infection is dealt with, large towel sponges are inserted into the most dependent fossae and the excess solution and debris gently mopped out, avoiding scrubbing and trauma. Of course, in every case abundant drainage, Fowler position, and Murphy drip are employed. If there is profound toxæmia saline hypodermoclysis is used also in order to more rapidly eliminate the toxins.

The fact that Nature's defensive elements are primarily active in an infected area within the peritoneum is manifested by the abundant outpouring of leukocytes around the focus of infection. These phagocytes are victorious in so far as they are able to encompass and combat a given number of the invading bacteria. In progressive cases, however, these are soon overcome and are no longer defensive, but become offensive, in that they have been mastered by the virulent infecting organisms. A case may end by localization of the infective processes, provided the spread of infection is not too rapid and the resisting forces of the economy are in good fighting order. If this does not obtain, or if the localized abscess ruptures into the general cavity, it is evident that there is a more extensive infection, which may go on to diffuse or even general suppurative peritonitis.

Large experience in the use of this drug and the clinical manifestations after its use in these cases, lead the author to firmly and conscientiously believe that the infected fluids that are free in the cavity are at once sterilized and that the absorption of toxins, which after all, is the *sine qua non*, mortality factor of peritonitis, is immediately terminated

for at least twenty-four hours. Also an outpouring of serum and new phagocytes is immediately encouraged. He is strengthened in this belief by the fact that a high temperature in these cases almost invariably falls in a few hours to normal or nearly normal. Then, too, there is an abundant serous drainage following, which is in excess of the usual drainage common in other methods. This tends to disgorge and in a measure wash out the subserous, cellular tissues, which may receive some beneficent, antiseptic effect through a process of osmosis directly from the iodine that has come in contact with the inflamed serosa.

Robinson correctly describes the peritoneum as a veritable lymph sac. If it were not for stasis and clotting in these lymph capillaries, every case of intraperitoneal infection, however mild, would be rapidly fatal. By the iodine method of treatment, these lymph capillaries are immediately coagulated, it is believed, for a period of at least twenty-four hours, during which time there is no absorption of toxins from the peritoneal surface lymphatics.

In Crisler's wide investigation of the elimination of the iodine element, it has never appeared in the urine earlier than the eighteenth hour after its use in the abdomen—then only in very small quantities. The height of elimination, which is almost entirely through the kidneys, is attained about the seventy-second hour. From this study the author conjectures that the absorption of toxins is held in abeyance for a like period. All the facts brought out by these studies, including clinical, physiological and chemical, combine to show the truth of this assertion. During this period there is developed in the patient an autoresistance and toleration, quite sufficient to overcome the disease. The author's conclusions are:

1. If it is true, as has been rashly advocated, that all cases of peritonitis will get well without the use of the iodine treatment then Crisler thinks the subject needs no further discussion. He has the following to say: "In our hands, we know beyond the question of a doubt that we have lost cases of peritonitis, before using this method, under the most careful and worthy surgical efforts of which we were capable. We know that since using this method we have not lost cases that were seemingly parallel to the others in every respect. We really feel so sure of our position that we no longer fear the outcome of these desperate cases so long as the patient reaches us with even a fighting chance for life."

2. As to the question of toxicity from the drug when used in the abdomen, the author affirms most emphatically that in his experience there has never been the slightest toxic effect evident at any stage, nor was there the slightest evidence of iodism in any case, even though the abdomen was washed out with as much as a quart of the solution, but little effort being made to remove the excess remaining in the various fossae. This observation includes hundreds of cases.

In answer to the question, "How is it possible to use an irritating chemical of sufficient antiseptic strength to destroy bacteria in the abdominal fluids, pouring it over and soaking it in the delicate endothelial linings, without producing an excoriation, from which, if the patient survived, there would be innumerable adhesions, producing a condition that would be probably worse than the one for which the remedy was intended to cure?" Crisler says: "This is the hardest argument of all to answer and deserves the most credit and consideration. To begin with, we have all seen the resulting effects in the way of adhesions which have followed a cured case of peritonitis without the use of the method and have been astonished at the multitude of adhesions and have wondered how the intestinal tube could possibly functionate in the midst of them. In 42 secondary operations (done mostly for ventral hernia) in which the iodine method was used, no cases were found to have, at any time, any serious adhesions whatsoever, beyond the ordinary omental adhesions in the hernial sac and around the hernial opening. The gratifying findings and the general good condition of the cases upon whom the secondary operation was done, has led to the hope and even the belief that the iodine method in treating peritonitis actually prevents adhesions. Whether or not the prolonged weeping of the peritoneum accounts for this it is impossible to say at present, as the author is not sure that the 42 cases mentioned would be a sufficient index upon which to base a conclusion, even though they represented some of the worst cases in which the solution was used most liberally.

Gale, S. S.: Some Observations on Drainage of the Peritoneal Cavity. *Firs. M. Semi-Month.* 1915, 33, 415.

The author touches upon the subject of peritoneal drainage, having recently had four cases of perforative gangrenous appendicitis. He believes that we drain our cases of peritoneal infection too long, that drainage of the peritoneal cavity for more than a very few hours is a physical impossibility.

J. R. BUCHHEIMER

Macmillan, J. A.: Peritoneal Adhesions and Their Relation to Intestinal Stasis. *Proctologist*, 1915, 33, 213.

The following are found to be etiologic factors in intestinal stasis:

1. Adhesions drawing the lower end of the ileum downward.
2. Adhesions causing displacement of the caecum towards the median line.
3. Adhesions drawing down the transverse colon so that a portion of it is made to lie parallel with the ascending or descending colon.
4. Adhesions fixing a loop of the sigmoid flexure in the abdomen above the brim of the pelvis.

These four conditions are types of cases that are common and when any one of them occurs there will be a form of chronic constipation that will re-

sist all forms of treatment except the removal of the adhesion.

Undoubtedly there are other portions of the intestine in which displacement and fixation will produce stasis. The determination of the adhesions which have this pernicious effect depends upon a detailed study of each case.

It is quite probable that when these cases are subjected to analysis, it will be possible to place them all in a comparatively few classes, and the diagnosis will be complete when the particular case is found to belong to a certain type.

EDWARD L. CORSTELL

Fairfield, W. E.: An Operation for the Cure of Hernia Between the Abdominal Recti. *Surg., Gynec. & Obst.*, 1915, 22, 171.

The overlapping of fasciae in the treatment of hernia is wrong in principle, as fascia does not tend thus to unite. The utilization of muscle tonus is the great desideratum. The present operation is applicable to all forms of hernia between the recti and depends essentially upon the conversion of the two fascial spaces containing the recti into one space, by a procedure which is the counterpart of the suture operation in a gastro-enterostomy, and in which the muscle sheaths perform the office of the stomach and intestine. Nothing is cut away.

1. The first row of continuous suture finds strong anchorage in the uncut sheaths.

2. The sheaths are split with scissors about one fourth inch external to the first row and the inner fascial flaps are united by a second continuous suture.

3. The outer fascial flaps are then united to each other, thus throwing the two muscles into one compartment.

4. Figure-of-eight tension sutures are made to include the skin and subcutaneous tissues in the outer loop, and the muscles are enclosed in their sheath in the lower loop.

The patient is kept in bed for three weeks and wears a binder thereafter only if she has a pendulous abdomen.

This operation differs from others in that — (1) no tissue is cut away; (2) like structures are united to like; and (3) the result is a supporting mass of muscles antagonizing hernial protrusion.

DuBose, F. G.: A New Operation for Umbilical Hernia. *Surg., Gynec. & Obst.*, 1915, 22, 700.

DuBose calls attention to the rôle played by the tendinous and ligamentary supports of the umbilical fascia in the production of recurrences after operation for cure of umbilical hernia.

The operation proposed restores the lines of traction so that the forces exerted at this point have a tendency to close the lines of spontaneous approximation rather than to pull them apart. Two transverse incisions are made, one at the upper and the other at the lower margin of the umbilical ring, paralleling each other; thus making two lateral

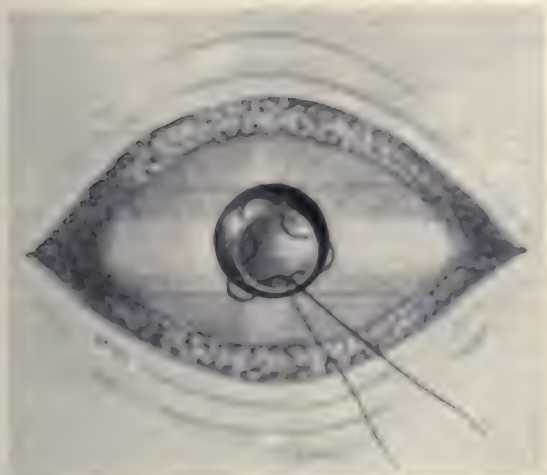


Fig. 1. Purse string suture in stump of hernial sac, dotted lines indicating proposed transverse incisions. (DuRoi.)



Fig. 2. Lateral flaps mobilized, sutures inserted. (DuRoi.)

fascial flaps which are mobilized and sutured together. The upper and lower fascial edges are approximated, overlapping the lateral flaps, forming a double aponeurotic wall with suture lines at right angles.

The round ligament of the liver above and of the urachus and obliterated umbilical arteries below are anatomically restored in the approximation sutures of the lateral flaps. Backward traction above and below by these ligaments tend to close and not pull apart the line of union. In the second or outer suture line in the aponeurosis traction from above and below by the linea alba which would

tend to pull the edges apart is neutralized by lateral traction force exerted by the tendinous intersections of the recti at the ends of the suture line.

Judd, E. S.: Subdiaphragmatic Abscess. *J. Lancet*, 1915, XXXV, 619.

The symptoms produced by these abscesses vary greatly; in many cases there is more or less of a general toxæmia with intermittent temperature, chills, and constant and marked leucocytosis; often the local symptoms do not appear until late. If the condition is the result of perforating ulcers, the previous history of ulcers will help in making the

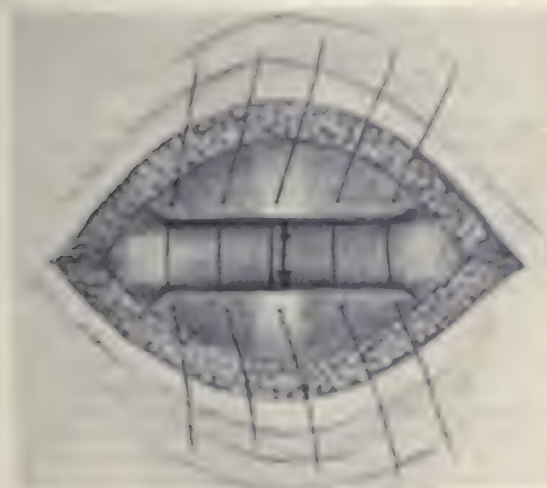


Fig. 3. Sutures inserted in upper and lower edges of aponeurosis. (DuRoi.)



Fig. 4. Closure of superficial aponeurotic layer, with figure-eight sutures inserted. (DuRoi.)

diagnosis. If it is the result of infection in the appendix, the symptoms will depend on when the patient is seen. If the subphrenic abscess is present at the time of the operation on the appendix, it will usually be discovered. Undoubtedly, in some of these cases in which the subphrenic infection is not a direct extension from the appendiceal infection, the subphrenic abscess has not been discovered at the time of the first operation.

A subphrenic abscess is not infrequently associated with, or the result of, other infections in the peritoneal cavity. The author emphasizes the importance of being on the lookout for these abscesses in connection with all types of septic conditions, no matter where the primary focus may be located.

Free drainage should be instituted as soon as the diagnosis has been established. The operator should plan an incision which will offer the most direct access to the abscess cavity. More often this will be posterior, and the dissection will extend upward. At times it will be necessary to drain through the pleura, and then it will be best to carefully suture the intercostal muscles to the diaphragm before opening the abscess, or to pack gauze down through the pleura to the unopened abscess, and leave it in place for several days to form protective adhesions before opening the pus cavity, in this way shutting off the pleural cavity from infection. When the abscess is opened there will usually be a gush of a large quantity of pus, and a good sized cavity will remain. If the drainage tubes are removed too soon, the opening will close over, and the pus will again accumulate, requiring secondary drainage. These abscess cavities, especially if the abscesses are of long standing, should be treated in much the same way as empyema cavities are treated, and the drainage tubes should be kept in place for a considerable period. The surrounding viscera having been displaced for some time become firmly adherent in their new position, but it requires more than a few days for the space to become obliterated.

The subphrenic abscess is attended with considerable mortality. The unfortunate results are often due to the fact that the condition was not diagnosed until the infection had become too extensive to be relieved by drainage.

GASTRO-INTESTINAL TRACT

Udaondo, C. B.: Clinical Diagnosis of Gastric Ulcers (Diagnostico clinico de las Ulceras del Estomago). *Rev. Asoc. Med. Argentina*, 1915, 100, 1115.

The author considers it extremely difficult to make a diagnosis of uncomplicated gastric ulcer, based upon the subjective symptoms or those revealed by the external surface of the epigastrium. Symptoms of ulceration are markedly evident in some cases, while in others there are absolutely no clinical symptoms. The mere presence of a hemorrhage does not indicate a process of ulceration of

recent formation, in three cases he operated upon, he has discovered the presence of caecum ulcers.

Six hundred cases of Meulien (Machlen's disease) are cited, in which 10 per cent of the cases only showed a sudden onset with crises of intense pain or hemorrhages.

The author's statistics showed pain was a constant symptom in 97.3 per cent of the cases. Cessation of pain upon eating is not considered by him constant, nor of any importance in the diagnosis. Moynihan's hunger pain was observed by him with relative frequency, not only in duodenal ulcer but in gastric ulcers as well. He does not attribute great importance to the classical radiation of the pain, which he found to vary greatly. On the other hand, periodical pains with normal digestive intervals, are of assistance in diagnosis. In Argentina, a country essentially carnivorous, the phenomena of hyperchlorhydria pains predominate. Spontaneous vomiting was noticed in 54.2 per cent of the author's observations and were associated with a localized painful spot, which findings are of great importance in the diagnosis of gastric ulcer of any location, and especially for juxta-pyloric ulcers. Hematemesis is, no doubt, one of the cardinal symptoms of ulcer, but Udaondo considers it an exceptional symptom, as he does not think it constant. Out of 50 cases, the diagnoses of which were controlled by operation and necropsy, he has observed only 10 cases of gastrorrhagia. On physical examination, the author noticed quite frequently that in ulcers of the lesser curvature there was an increased resistance of the left rectus muscle, in marked contrast to the right rectus. This interesting sign he found most frequently in ulcers with a tenacious perigastritis.

The author does not consider the finding of the dorsal point in patients with ulcer of great diagnostic value although Boas popularized it and found it in a third of his cases. Of 50 cases, only 2 showed a clear dorsal pain, both had ulcers of the lesser curvature, one in the cardiac vicinity, the other in the median line. The use of the sound—by many contraindicated in these cases—did no harm, although it gave rise to gastrorrhagia afterward. Hyperacidity was found by the author in 64.4 per cent of his cases. The investigation of the antiferments in the bloody gastric contents is, in his opinion, only of relative importance. The presence of occult hemorrhages in the gastric content or in the retained liquids, he considers of the utmost importance in establishing the diagnosis. It appeared in 72 per cent of his cases.

The finding of a small quantity of acid, with or without a residue, he has noted more frequently than gastro-intestinal hemorrhage and also in distant pyloric processes. Sounding on an empty stomach resulted in securing from 20 to 100 ccm. of acid fluid, rich in ferments and with microscopical residues. The author also observed in four patients the coexistence of a continuous and digestive hypersecretion in juxta-pyloric ulcers.

Statistics of 20 cases of ulcers of the lesser curva-

ture, showed acid fluid retention varying between 16 to 175 ccm. No absolute diagnostic value should be attributed to the perversion of gastric motility.

A methodical examination of the faeces has enabled the author to recognize a latent ulcer in three cases, although the patients showed only symptoms of dyspepsia.

The author is of the same belief as the French scientists that the process of a pyloric ulcer is analogous to that of the duodenum and that a distinction can only be made in lesions situated at a distance from that orifice.

The molecular concentration of the residual fluids according to Winter's technique, is without doubt of value in the determination of pyloric ulcer, knowing that the figure of concentration of a pure secretion is 0.012.

The localization of ulcer of the lesser curvature can in some cases be made clinically; the majority of them, however, require radioscopic confirmation. He found that the subjective localization was never constant nor clearly defined. The majority of his cases showed phenomena of hypervagotonomism, exteriorized clinically by a pyloric spasm, small retentions, bradycardia (a pulse of 50 to 60), and miosis.

The four conditions that may be confounded with gastric ulcer are: duodenal ulcer, cancer of the stomach, cholelithiasis, and gastric neuroses.

The diagnosis of the cancerous change of an ulcer he found to be extremely difficult; he could only base the diagnosis on presumptions. The palpation of a tumor even is not a sure sign.

In conclusion, the author states his belief that gastric ulcers are easily recognized in the majority of cases. Ulcers of slow development and vague symptomatology require repeated and extensive examinations. Although the signs mentioned by the author are uncertain, yet in conjunction with the particular syndromes, they will reveal in part the nature of the lesion. All depends on the sagacity of the clinician.

RAOUL L. VIOIRAN.

Warren, R.: Perforation of Gastric and Duodenal Ulcers. *Lancet*, Lond., 1915, cxxxix, 1239.

The author bases his observations on 40 personal cases of acute perforation of gastric and duodenal ulcers. All were operative cases and in the series there was a mortality of 35 per cent. There is a striking difference in the mortality of gastric and duodenal ulcers, the former showing a 54 per cent mortality and the latter 25 per cent. Of the 40 cases, 29 were men and 11 women. In the women 9 had gastric ulcers and 2 duodenal; of the 29 men, 25 had duodenal ulcers and 4 gastric. The youngest gastric ulcer patient was seventeen years of age; the youngest duodenal ulcer patient was twenty-two.

The author's experience has been similar to that of others, in that there is a definite area of election, the perforating ulcer almost always occurring between a point about one-fourth inch on the gastric side of the pylorus to about one inch down the

duodenum. They are usually on the anterior surface. He is not able to speak with any positiveness as to the chronicity of the ulcer in these acute perforation cases, the very acuteness of the condition, with the hard oedematous area surrounding the ulcer, making any opinion as to the duration of the ulcer, based on the physical findings, decidedly problematical.

He brings out nothing new in the question of diagnosis but emphasizes the most important point, that is, the persistence of rigidity, even in the subsidence of pain and other symptoms, and he states that he has never seen a case where the rigidity passed off even for a time. In estimating the prognosis of a given case he thinks that the most concrete sign is the pulse-rate, and although in certain instances the sign fails, yet in the majority of cases if the pulse is over 120 the prognosis may be looked upon as bad, and Warren's statistics bear out this statement.

He confirms the observation of others in regard to the time elapsing between perforation and operation; that is, operation during the first twelve hours of the attack is much more liable to be followed by recovery than operation undertaken later. He does not refer to the rather important point that patients who survive, following operation later than 24 hours, would probably have had a fair chance of recovery without operation.

Regarding actual operative treatment, intraspinal anaesthesia was occasionally employed, but apparently the author was not very favorably impressed with it.

What would probably be a rather useful point to remember, in certain cases which are not quite characteristic, is his advice to first explore the appendix through a small split muscle incision, as an acute appendicitis is the most likely condition to be confused with perforated ulcer. If the appendix is found innocent he uses this small incision as a means of pelvic drainage.

In the closure of the ulcer he refers to the advantages in certain cases of a graft of detached omentum. Regarding the advisability of a gastro-enterostomy at the same time, he believes that if the patient's condition will permit of this procedure it should be done, and agrees with other writers on the subject, that it improves the prospects of ultimate success.

He believes that there is a definite field for jejunostomy in these cases, and where the patient's condition is not only bad but has been impoverished by poor digestion previous to the catastrophe, he advocates a jejunostomy to obtain the advantage of immediate fluid nourishment. Although the actual results in his own cases would not seem to support this contention, yet it must be remembered that jejunostomy was employed only in the most serious cases. In the tabulated results of the different types of operation it is evident that closure of the ulcer combined with gastrojejunostomy has given by far the best results.

D. C. BALFOUR.

Finochietto, S.: Surgical Treatment of Gastric Ulcers (Tratamiento quirúrgico de las úlceras gástricas). *Rev. Asoc. Med. Argentina*, 1915, XXIII, 1351.

The proper surgical treatment of gastric and duodenal ulcers is gastro-enterostomy, in the author's opinion. The operation done under favorable conditions is of little gravity and the results most satisfactory.

The mortality rate in the author's cases was 5 per cent. Early diagnosis and surgical indications, as well as a perfected technique should reduce the number of bad results. He considers that from 70 to 80 per cent of the cases are entirely cured by operation. Other patients (15 to 20 per cent) have a persistency of some of the symptoms which require a severe dietetic régime for a long period of time and medicinal treatment continued with regularity.

The persistency of symptoms or their recurrence was noticed in 2 to 5 per cent of the author's cases. The surgeon should bear in mind the fact that gastro-enterostomy is not an anodyne operation, but besides establishing an abnormal communication between two points of the gastro-intestinal canal which are not usually continuous, changes occur in the chemistry of the stomach which are of great importance. The author has seen in a patient a coincident sigmoidorectal hemorrhage and excruciating epigastric pains during the digestive periods. The gastric pains were due to adhesions between the omentum and the genital organs and disappeared after the necessary operation. In other cases he noticed that the gastric crises were due to the presence of a twist in the terminal part of the ileum. Peptic, jejunal, or gastrojejunal ulcers may result at the place of anastomosis, due to errors in technique or to a bad selection of the seat of implantation of the new opening. The author found this disagreeable sequel of gastro-enterostomy present in from 2 to 3 per cent of the cases operated upon, and no matter to what extent modern technique has been perfected, such occurrences have not been totally eliminated. Gastrojejunostomy by implantation has been entirely abandoned, because it impedes the passage of bile to the stomach and consequently the neutralization of the acid content of the stomach, the wound and a few centimeters of the jejunum remaining exposed to a constant irritation by these juices.

In his operations for this condition, the author makes use of anastomotic buttons, so as to avoid imperfect coaptation of the mucous margins or their excessive constriction by the sutures. A jejunal ulcer which he found at a second operation, he believes was the result of a gastro-intestinal operation.

The author agrees with W. J. Mayo that a peptic ulcer is mostly due to the non-absorbed suturing material, and he found this condition existent at the level of the anastomosis, three years after the first operation. He found that the surgical treatment of duodenal ulcers gave excellent results. The opera-

tion the author prefers is gastro-enterostomy with or without any additional manipulations at the level of the ulcer.

He further cites Doyen's operation of pyloro-gastroduodenostomy, the technique of which was perfected of late by Finney and finally by Gould. Its results he does not consider to be superior to those following a gastro-enterostomy. He approves of and practices with satisfactory results the invagination or infolding at the level of the ulcer, generalized by Moynihan and W. J. Mayo, modifying the relationship between the ulcer and the peritoneal serosa. The author quite frequently performs a similar manipulation of all the neighboring organs, stomach, biliary vesicle, greater omentum, in cases in which he fears perforation and in which it is not possible to perform the invagination of the duodenal parietes only. He considers the excision of the ulcer as a complement to gastro-enterostomy of no value as far as a possible degeneration of the ulcer into cancer is concerned; however, he considers important the avoidance of perforation or hemorrhage of the ulcer.

The derivative action of gastro-enterostomy is negligible when there exists at the pylorus an organic obstacle or a spasmodic condition; in the latter Finochietto found the effect of the operation to be intermittent. In his opinion, the exclusion of the pylorus can not better in any way the physiologic changes occurring, such as the presence of bile in the stomach, and the author considers it an unnecessary complication and affirms that the removal of the pylorus offers no advantage or improvement over a simple gastro-enterostomy.

Surgical treatment of gastric ulcer at the opportune time is by far the safest procedure, thus avoiding grave complications, so frequent, and the possible degeneration of the ulcer into cancer.

The author believes that all operations for excision of ulcer or cancer of the stomach should be accompanied by gastro-enterostomy. When the ulcer is situated in the vicinity of the pylorus, the author prefers to perform a pylorotomy and gastro-enterostomy (operation of Rodman).

RAOUL L. VIDIAN.

Walscheid, A. J.: Report of a Case of Visceral Ptosis Cured by Rovsing's Operation. *Internat. J. Surg.*, 1915, XXIII, 381.

The author reports a case of marked ptosis involving the stomach, transverse colon, and liver. A gastropexy was done by the Rovsing method (fixation of the entire wall of the stomach to the anterior abdominal wall), a hepatoxexy by suspension of the liver by its round ligament, and a colopexy by suturing the upper surface of the transverse colon to the greater curvature. Nine months after operation the patient had gained eleven pounds in weight, had no more gastric disturbance, and the constipation which had been obstinate was apparently cured.

HENRY J. VAN DER BEEK.

Walton, A. J.: *The Clinical Aspects of Visceroptosis*. *Brit. J. Surg.*, 1915, iii, 185.

For the purpose of throwing light on the question of differential diagnosis in the various clinical forms of visceroptosis, Walton has analyzed a series of 65 cases.

In the series, 20 cases were diagnosed as appendicitis: 10 as chronic and 13 as acute.

1. In the 13 cases of acute appendicitis, only 2 were in males; the average age was 17.

In a typical case, there would be severe abdominal pain, localizing in the right iliac fossa, vomiting and constipation. The temperature of the majority was about 99° , in one case only was it over 101° .

In all cases there was deep tenderness over the appendix. In 5 cases there was well marked rigidity in the right iliac fossa, and in one there was a definite mass simulating an abscess.

At operation, in all cases the appendix was found free from acute inflammatory change, and in the majority it was perfectly healthy in appearance. However, in all instances the cæcum was remarkably mobile. Jackson's membrane was always present, and in 2 cases the so-called Lane's kink was present.

The operation in all cases consisted in appendectomy and division of the membrane. In every case, within 12 hours, the temperature fell to normal and the pain disappeared. Microscopical examination of the appendix showed no definite inflammatory change.

In 7 cases, after four to six weeks' relief, slight symptoms recurred but could be relieved by the use of liquid paraffin, abdominal massage, exercise, and wearing a belt.

2. In the 16 cases of chronic appendicitis, 13 were females, and the average age was 28.5 years.

In a typical case there would be a history of repeated attacks of pain, the first being the most severe, but growing more frequent until the pain persisted almost continuously. Most commonly, however, the patient would not be in bed over a few days. Vomiting was a marked symptom, with no relief from the pain. There was no rise of temperature.

On examination, it was usually noticed that the patient was poorly built, a long, narrow waist and a narrow costal angle with deficient muscular development. There was deep localized tenderness in the right iliac fossa and frequently the right kidney was easily palpable.

At operation, the conditions of the previous section were found, with the exception that Lane's kink appeared more frequently. Similar operative procedures were used. Five cases were completely cured, in 3 the symptoms disappeared, and the remaining 8 all report a return of symptoms, relieved, however, by wearing an abdominal belt, by liquid paraffin treatment, etc.

In the diagnosis, the moderate rigidity, the slight pyrexia, and, if the attack has existed for some days, the absence of symptoms of local abscess will aid in

differentiating from acute appendicitis. In doubtful cases, operation is advised.

In the chronic form, the recurrent attacks of moderate intensity, pain localized from the beginning in the right iliac fossa, its persistence between attacks, absence of temperature, superficial tenderness and rigidity, with the presence of a visceroptotic build, should diagnose the case.

There were 27 cases resembling gastric ulcer, 5 of which had a gastric or duodenal ulcer in addition to visceroptosis. In the remaining 22 cases, 18 were female and 4 male, with an average age of 36.

There would be a history of several attacks extending over years, with a moderate amount of discomfort and flatulence more or less continuously. The attacks would not last long, and, as a rule, the longer the pain, the longer the free intervals. In the attacks, there would be acute epigastric pain radiating upward or downward, often occurring immediately after eating. In a majority of cases, the pain persisted throughout the day. Relief was often obtained by alkalies and at times by a recumbent position. Food relieved the pain in only one case. Vomiting was a common symptom, sometimes partly relieving the pain and frequently not at all. In 11 cases, hæmatemesis was present, often severe, and probably due to small multiple erosions in the gastric mucosa (Bolton). Anorexia was frequent during the attacks.

In 15, a test-meal was taken: 8 showing diminished total acidity and 7 showing normal contents.

On examination, the visceroptotic build was common (long narrow abdomen, high, narrow costal angle, and distended stomach). One or both kidneys were usually mobile.

At operation, no ulcer was found, the stomach was prolapsed, U-shaped, with spasm of the pylorus. The cæcum was freely movable, with Jackson's membrane and Lane's kink.

The appendix was removed and the membranes divided. In one case with excessive pyloric spasm, a gastro-enterostomy was done, and in 2 cases with movable kidneys, a nephrorrhaphy was carried out. The results, as a whole, were unsatisfactory; the symptoms returning after two to six months. In certain cases wearing a belt afforded some relief.

In uncomplicated cases, the diagnosis of visceroptosis is based on the shorter, less well-defined attacks; the persistence of pain and flatulence between them, the lack of relief from vomiting; the lack of relationship of the pain to food; and the diminution of free HCl in the test-meal.

There were 6 cases resembling cholelithiasis, 4 females and 2 males, with an average age of 45. The usual symptoms were daily indigestion, flatulence, and epigastric fullness coming on with the ingestion of food. Vomiting was slight. In 3 cases, the pain was severe, colicky in type, and radiated to the back; 2 of these cases had movable kidneys, the fixation of which stopped the pain. In only one case was there blood in the stools. On examination, the conditions previously described were found.

Occasionally there would be a slight tenderness over the upper right rectus. At operation the same conditions found in the previous sections were present. The after-results were likewise unsatisfactory and belts did not afford much relief.

The diagnosis of this condition rests mainly on the clinical examination. The gall bladder is not enlarged, there is no Murphy's sign, and no superficial tenderness posteriorly. There is, however, the visceroprotic appearance and findings.

There were 3 cases resembling cancer of the stomach, 4 males and 1 female, with an average age of 53. There was a history of constant epigastric pain for only a few months, increased by food, at no times severe, and rarely present at night. There was frequent vomiting of small amounts, with no relief. Considerable regurgitation of gas, distention, and flatulence were also present, but were relieved by vomiting. In one case only was there blood in the vomitus, with blood in the stools as well. There was anorexia and loss of weight. Stomach analysis showed no trace of free HCl in 4 cases, with a variable total acidity.

On examination, there was considerable wasting and some anemia noticed. No tumor was palpable, but a certain amount of epigastric tenderness and rigidity was observed. Knee jerks were normal. At operation, no evidence of carcinoma or other gastric lesion was found. However, the usual signs of visceroprosis were pronounced. The operative procedures consisted merely of the division of bands and adhesions. The results were unsatisfactory. The symptoms returned and in one or two cases were relieved by a belt.

This condition is very difficult to differentiate, as the condition may simulate cancer in all details. Exploratory laparotomy in doubtful cases is always indicated.

The conclusions are as follows:

1. Visceroprosis commonly simulates organic lesions of the appendix, stomach, and gall bladder.
2. Except in gastric cancer, a differential diagnosis is possible.
3. Occasionally visceroprosis coexists with an organic lesion, making a diagnosis very difficult.
4. Operative results are unsatisfactory; if in doubt, operate; otherwise medical treatment should be instituted.
5. In cases resembling gastric cancer, early operation is advisable, lest an early neoplasm be overlooked.

P. M. CHASE.

Zander: Stomach Surgery [Beiträge zur Magen-chirurgie. München med. Wochenschr., 1915, lxxv, 1415.]

Zander discusses some important points in the differential diagnosis of stomach diseases. A history of a short course of the disease indicates carcinoma, a long course ulcer. If the disease begins in middle or old age it is indicative of carcinoma. In such cases time should not be lost in long-continued observation and attempts at treatment, but

operation should be advised at once. Roentgen examination is also important in the differential diagnosis. Zander reported 84 stomach cases that he had operated upon. In ulcer of the pylorus gastro-enterostomy is indicated, but in ulcers at a distance from the pylorus gastro-enterostomy is inadequate and resection is to be preferred. Resection should be performed in cases of callous ulcer where carcinoma cannot be excluded with certainty.

The author believes with Aschoff that ulcer rarely undergoes transformation into carcinoma. He is not very well satisfied with the results of gastro-enterostomy in carcinoma.

Two classes of carcinoma are to be distinguished: small scirrhous carcinoma of the pylorus, and large ichorous tumors. The former gives the clinical symptoms of stenosis of the pylorus, and the results of gastro-enterostomy are excellent, but in the latter gastro-enterostomy is not very effective. The signs of stenosis disappear, but pain persists on account of adhesions to the pancreas and other organs, and the patients die, generally in a few months, with signs of auto-intoxication from the broken down tumor. Therefore the author believes, as do a number of other surgeons, that the indications for radical operation in carcinoma of the stomach should be extended. Even if the patients cannot be cured by removal of the tumor they can be relieved of symptoms and life be preserved for a longer time than by gastro-enterostomy. The great fear of extensive lymph-gland metastases is not justified. The reason gastro-enterostomy is generally preferred is that it is less dangerous and can be performed quicker. Resection is more dangerous, more difficult, and takes longer. The author prefers sewing the intestine into the open lumen of the resected stomach. This saves time and is safer and cleaner than any other method he knows of. He has used it in 20 cases of advanced carcinoma.

In the discussion FIFLITZ disputed Zander's conclusions with reference to the radical treatment of stomach carcinoma. He thinks resection should be performed only in very favorable cases, otherwise gastro-enterostomy should be done, for the mortality of resection is greater and the patient is relieved only for about the same length of time as by gastro-enterostomy. In resection he prefers the method of suturing the two stumps of the stomach together by Kocher's method. A. GOSS.

Boughton, G. C.: Intestinal Stasis. *Internal J. Surg.*, 1915, xxviii, 186.

Intestinal stasis results in toxic absorption causing definite symptoms of the circulatory system, gastro-intestinal troubles (flatulence and constipation), abdominal pain, and tenderness and malaise.

Visceroprosis, caused by the erect posture in man, produces non-inflammatory adhesions and bands. As a direct result of preternatural strain these adhesions are not equally strong, consequently

the bowels are not held up equally, therefore kinks are formed which lead to some degree of obstruction. These kinks occur at definite points:

1. The third portion of the duodenum.
2. The lower end of the ileum. As a result of ileal stasis bacteria normally confined to the large intestine ascend the ileum, giving rise to decomposition of its contents.
3. Hepatic flexure and the first part of the transverse colon caused by bands running from the undersurface of the liver down to the colon.
4. The sigmoid loop.

In the ileocecal region the appendix is oftentimes involved. When the patient assumes a standing position the cæcum drops and the appendix is hitched up at the fixed point and obstructed. Distention of the distal portion of the appendix then occurs and inflammation follows. The author thinks that many patients who have been operated upon for appendicitis have no more serious ailments than these bands.

For treatment he recommends good hygiene and properly regulated diet with tonics and other supportive measures. In place of ordinary cathartics he advises the use of liquid paraffin or Russian oil.

HENRY J. VAN DEN BERG.

Waller, C. C., and Cole, L. G.: *The Appendix*. *Surg., Gynec. & Obst.*, 1915, xxi, 750.

A brief review is given of the related researches of Cannon and Keith relative to the characteristic movements of the intestine; and an elaboration of the observations of Rutherford, together with the clinical and roentgenological studies of the authors.

The chief effort of the authors is to establish, if possible, the functional factors of the appendix, evidence confirmatory to preconceived opinions being presented through the avenue of fluoroscopic observation.

Basing his opinions upon these findings, the author concludes that the same mechanical factors obtain within the appendix musculature as elsewhere along the intestinal tract. Peristaltic and sphincteric action was observed fluoroscopically. Obviously there exists at the cæco-appendiceal juncture a specialized sphincteric mechanism of both clinical and surgical importance. The periodical filling and emptying of the appendix is regarded as a normal and essential function; in this the appendix is inferentially regarded as a physiological culture-tube.

Perhaps of greater significance and real importance are the points derived in the study of the appendix as reported in this article. A serial or "field-day" clinic was employed, consisting of 27 children selected with care as being free from abdominal disease. The relative frequency with which involvement of the appendix and adjacent structures are encountered in young children is at once apparent from a careful analysis of this report. From these observations and the physical examination of a large number of children, case histories, etc., the

authors feel justified in the assumption that the initial lesion of appendicitis is one of infancy or early childhood, and that many of the ills common to this age are but manifestations of this process.

In conclusion it is suggested that in the removal of the diseased appendix care should be exercised not to include the slightest portion of the sphincteric musculature within the invaginated stump, a careful resection being the method of choice.

Suzuki, K.: *The Role of Oxyuris Vermicularis in the Etiology of Appendicitis and Allied Pathological Conditions*. *Surg., Gynec. & Obst.*, 1915, xxi, 702.

In an appendix the oxyures may be harbored, not only in the lumen, but also in the mucosa and submucosa; this may occur without producing any clinical symptoms or any noteworthy anatomical changes.

A case is sometimes encountered in which an appendix infected with oxyures is inflamed through a totally different agent. For this reason the origin of appendicitis cannot be attributed to the worms, although these parasites have been found in inflamed appendices. In the majority of cases the presence of the oxyures in cases of appendicitis, whether chronic or acute, is to be considered purely accidental.

It has been ascertained that a true inflammation is provoked by the parasites when the latter have penetrated the wall of the appendix in large numbers, and that the traumatically destroyed fissure in the tissue is for a protracted period of time in connection with the lumen, thus offering the infecting agent a portal of entry. This type of the disease affords distinct histological data, for which reason it has been designated by the author "appendicitis oxyurica." But this type is only rarely met, and among 103 surgically extirpated appendices it was encountered but once.

A non-inflammatory but pain-producing morbid condition of the appendix is sometimes caused by the oxyuris, in which case traumatic destruction of the tissue accompanied by hæmorrhage can always be demonstrated. It is very much to be doubted whether oxyures which are merely situated in the lumen are able to cause this painful condition without any accompanying anatomical changes. Among the 103 cases cited, 3 such cases were found.

The author's investigations enable him to affirm with certainty that a part of the oxyuris passage and cleft, of which Rheindorf speaks, and several fine fissures in the lymph-nodes seen in his illustrations, as well as certain defects at the edge of the mucosa, where no oxyures are to be found, are to be looked upon as artefacts. But on the other hand, Aschoff is, in the author's opinion, mistaken in considering every oxyuric passage and fissure to be purely artificial in origin, since the evidence of the author's own preparations, presented in this paper, must lead one to admit that an undoubted cleft is occasionally formed by the parasites.

Schaefer, A.: Technique of High Amputation of the Rectum (Vortrag zur Technik der hohen Rektumamputation). *München med. Wchnscr.*, 1913, LV, 1137.

The wound in amputation of the rectum rarely heals by first intention, as it becomes infected from the stump of the rectum which is sewed into it. To avoid the suppuration resulting from such infection and to secure prompt healing Schaefer leaves a stump about 8 or 10 cm. long and lets it hang down outside the wound. The end of it is ligated with gauze for the first two days. It does no harm if the patient does not pass any gas for this length of time. Then the intestinal contents are allowed to pass. The wound of course and the whole buttocks have previously been carefully protected with dressings and adhesive plaster. The patient lies on his side and the stump hangs into a suspended urinal. As a result of its poor arterial supply the stump mummifies in five to seven days and a good sacral anus is formed of itself. If there is any prolapsed mucous membrane it may be removed in the usual way. After this length of time the wound is nearly or quite healed and there is little danger of infection.

A. Goss.

LIVER, PANCREAS, AND SPLEEN

Elliott, J. B., Jr.: Abscess of the Liver. *South M. J.*, 1913, VII, 1019.

The author reports 116 cases of abscess of the liver, in which the diagnosis was confirmed by aspiration, operation, or post-mortem findings. Of these cases 41 gave a definite history of dysentery, some dating back many years, while others had just recovered from acute attacks. Definite histories of chills and fever were given by 28. All but a very small percentage gave most definite histories of pain in the region of the liver as the most prominent symptom. Of the series 73 recovered, 40 died, and 3 deserted. Of those dying, 6 were practically moribund on admission. Of the 6 cases not operated upon, 1 died on the operating table, 1 died of pneumonia, 2 died with diagnosis of tuberculosis, 2 ruptured into the lung and were cured by the use of emetin without further operative interference.

TABLE DEMONSTRATING THE 116 CASES

Crozier Hospital at New Orleans	24
Texas Institute at New Orleans	23
Stanley Hospital at New Orleans	100
Number operated	116
Number died	40
Number recovered on emetin	5
Number not operated upon	9
Number recovering with lung	1
Number giving history of dysentery	41
Number giving history of chills and fever	28
Number giving history of trauma	4
Number in which pus was found	73
Number in which left lobe only involved	10
Average duration of illness in operated	25 days
Average mortality found in 25 cases	20 per cent
Average mortality found in 25 positive emetin cases	20 per cent
Length of time usually took before admission	
Doubtful cases	12 to 3 weeks
Certain cases	2 to 3 weeks

While the ameba *histolytica* was found in only 24.3 per cent of this series, the author believes that more correct methods of investigation as outlined would show it to be the primal cause in at least 80 per cent of the cases.

The most constant symptoms are pain in the region of the liver, loss of weight, and increased leucocyte count.

The aspirating needle used for exploration should be at least five inches in length.

Exploratory laparotomy is justifiable in doubtful cases.

Emetin should be used in all cases of hepatic abscess as a regular post-operative measure.

All cases of recurring diarrhea occurring in the South should be studied carefully, as many of these cases are amebic in origin, and it is only by careful attention that the incidence of hepatic abscess can be reduced.

EDWARD L. CORNELL.

Lane, J. W.: A Plea for Cholecystectomy. *J. Am. M. Ass.*, 1913, LV, 1794.

The author advances a strong plea for the routine performance of cholecystectomy in place of cholecystostomy in all infected gall-bladders.

So far as we know there is nothing in the function of the gall-bladder that contra-indicates its removal. Murphy has suggested that it acts as a bulb in maintaining an even pressure in the gall tracts; Mayo says that it is probably in an "obsolescent" stage of embryology. According to Moynihan, "the gall-bladder is devoid of any strikingly useful purpose." The two chief contra-indications to removal are pancreatic disease and insurmountable obstruction of the common duct.

The author feels that removal is the safer operation; with it leakage is less, and if done in all of the cases where drainage is now done the mortality would be lower. According to Finney if we took into consideration the number of secondary operations necessary after drainage, "there would be little to choose from in respect to the mortality rate between the two."

Cholecystectomy gives the most likelihood of permanent cure. Convalescence is much shorter and far more comfortable; drainage is maintained at the most for 48 hours. The possibility of the gall-bladder being needed for drainage in subsequent trouble in the upper quadrant is remote; this would be more apt to occur if the gall-bladder were left behind.

The author bases his paper on 77 cases with 3 deaths. In one death after a cholecystectomy had been done he found a carcinoma of the common duct; in the second, heart and kidney conditions made the patient a poor surgical risk.

J. R. HUBBARD.

Van Beuren, F. T., Jr.: The Diagnosis of Biliary Obstruction by Calculus. *Mod. & Surg. Report Roosevelt Hosp., N. Y.*, 1913, p. 61.

There were in all 14 operations for choledochotomy performed on 32 patients, constituting 1

per cent of all cases discharged from the Roosevelt Hospital during a five-year period. Of those having gall stones, 16 per cent had calculi obstructing the common duct.

As to age, 66 per cent of cases were in patients between 40 and 60 years of age; 14 per cent were from 30 to 40; 11 per cent, 20 to 30; and 11 per cent, 60 to 70. Of the 15 patients who were interrogated as to whether they had previously had typhoid fever, only 3 gave a positive history.

As to the duration of symptoms referable to the gall-bladder region, only one had had no previous symptoms. In one case the symptoms had persisted for a period of 30 years. Ten patients were able to give the dates between the first evidence of cholelithiasis, and the first sign of obstruction. Two months was the shortest interval between the attacks and the longest was eight years; the average being three and a half years.

Of 25 patients who were asked if previous operation on the gall-bladder or ducts had been performed, 6 had had their gall-bladders drained, in 6 it had been removed, 1 had had it drained and then partly removed. Three of these cases had previously had calculi removed from their common duct.

Nearly four-fifths of the cases had a temperature less than 101° F., the highest being between 104 and 105°.

A majority located the pain in the upper right quadrant of the abdomen; one-fourth located it in the epigastrium; 1 behind the umbilicus, 1 in the back on the right side; a third complained of the upper half and a fourth of the lower half of the abdomen. Two claimed that they had practically no pain whatever.

The pain was described as a dull ache, as a steady severe pain, sharp or knife-like, as colicky like cramps, and as an unbearable griping pain. The attacks of pain lasted from a few hours to three or four days; 3 gave the time as from one to three weeks; 1 had pain for a short time only and it would come on an hour or so after taking food.

Radiation of pain was noted in 8 of the patients, with eleven different combinations, including the back, shoulders, and both sides. There was no characteristic difference in the radiation of pain of those previously cholecystectomized, except that they located the pain in the epigastrium, rather than in the hypochondrium. Three-fourths of the patients had suffered from indigestion, constipation, and vomiting during the attack.

Six per cent of the cases had not had jaundice previously. Jaundice was present on admission in 28 cases of the 29, in which it was recorded in the history. Loss of weight was marked in 7 cases; there was a loss of 15 to 46 pounds in one year.

In one-half the cases examined abdominal rigidity was present, while of 27 cases recorded abdominal tenderness was marked in 12, slight in 13, and absent in 2.

Seven out of 15 cases showed slight enlargement of

the liver. In only one case was the spleen markedly enlarged.

The coagulation time of the blood was taken in 10 cases, and in 4 cases it was found to be retarded. There was no severe hemorrhage either preceding or following the operations. D. L. DESPARD.

Beye, H. L.: Perforation of the Biliary Tract; Report of Two Cases. *J. Am. M. Ass.* 1911, LV, 2084.

A schoolboy, aged 11 years, while playing, received a blow in the abdomen from one of his playmates, which caused him to faint and, after gaining consciousness, he was in so much pain that he screamed and had to be carried home. During the following night he complained of a great deal of pain and was very restless. The next morning he vomited profusely and the pain became worse on the left side and was more marked than on the right. The temperature ranged between 100 and 101° on this day. The bowels refused to move, even with enemas and after calomel. There had been no chill. Under ether anesthesia, a midline incision was made below the umbilicus. There was peritoneal edema. The abdomen contained a large amount of bile-stained fluid and considerable fibrin in plaques. The proximal half of the small intestine was distended and the distal half collapsed. The intestines were examined for perforation and none found. The incision was carried up to the right of the umbilicus to the gall-bladder region. The gall-bladder was found to be thickened and adherent to the liver and contained a single perforation in the fundus from which pure bile was pouring. No stones were found. A rubber tube drain was led down to the perforation, together with a cigaret drain and a strip of iodoform gauze. A rubber tube drain was also led from the pelvis at the lower end of the incision. The usual closure was made. The patient was placed in Fowler's position and given normal salt solution by rectum and nothing per mouth. Recovery was uneventful. The patient left the hospital on the fifteenth day.

The second case occurred in a housewife, who, for several years, had had occasional attacks of belching of gas, sometimes with vomiting, independent of meals. In February, 1913, she suddenly had a severe tearing pain under the right costal margin, radiating to the pit of the stomach. Following this she vomited profusely for several hours. The pain lasted an hour or more, causing her to cry out in agony, and was finally relieved by a hypodermic. Four weeks following this attack she became jaundiced, and this condition persisted until the next fall. In July, 1913, she had a similar attack.

Ever since the first attack the right side had been tender and a swelling gradually formed, pointing in the right flank above the iliac crest. This finally approached the surface, the skin overlying became reddened, and it was lanced. An odorless fluid was obtained, at first thin and yellow, and later thicker.

This gave her immediate relief from the constant ache and pain, but after that there was a persistent discharge of a mucous secretion and she passed four wheat-sized calculi. The general condition was good, except for an increasing gnawing, burning sensation in the epigastrium, not referable to food taking. In September, 1934, under ether anesthesia, a right rectus incision was made above the level of the umbilicus. The gall-bladder was found to be long and narrow and was slightly adherent to the omentum and at the fundus to the abdominal wall at the inner end of the fatilous tract. A large mulberry stone was found impacted in the cystic duct. The gall-bladder was excised from its connection to the abdominal wall and cholecystectomy was performed. Tube draining was carried to the stump of the cystic duct and an iodoform gauze drain through the nixus. The course was uneventful except for the formation of a hematoma in the operative wound and the passage of a small calculus from the old fistulous tract, following which the latter healed.

EDWARD L. CORNELL

Deaver, J. B.: Acute Surgical Diseases of the Pancreas. *Penn. M. J.*, 1915, xix, 179.

The view is still prevalent that the majority of infections of the pancreas arrive by way of the ducts and concern chiefly the duct system of the gland. A large number of cases of this affection in which gallstones were absent are now on record. The most startling development of the last few years is the frequency with which the lesser degrees of pancreatic inflammation are found by the surgeon, particularly in connection with infections of the biliary tract. In the chronic and subacute types of pancreatitis, the pathogenesis of the disease may be better studied than in the acute forms. A study of these conditions has led to the conclusion that most of these associated pancreatic conditions are instances of infection through the lymphatics. The gall-bladder and hepatic tract are incriminated chiefly by reason both of the frequency with which infection secures a lodgment in these organs and the close relationship which the biliary lymphatics bear to those of the head of the pancreas. The duodenum also may communicate infection in the same way and possibly other portions of the alimentary tract may on occasion involve the pancreas by way of the retroperitoneal lymph paths.

But little is known of hematogenous infections in relation to the pancreas. The organ seems to be relatively immune and usually escapes in bacteremia and septicemia. The recent revelations of Rosenow in connection with infections of the gall-bladder and pyloric region, if confirmed and extended to the pancreas, may alter the prevalent ideas as to the frequency and importance of blood-borne infections.

The clinical evidence at present, however, points to pancreatitis being a disease which is most commonly the outcome of upper abdominal infection

and secondary in most cases to disease of the less resistant neighboring organs from which it becomes infected by lymphatic spread.

It is a mistake to believe that acute pancreatitis cannot occur without the usual severe manifestations. The author is convinced that many such cases occur and are regarded as instances of gall-bladder, gastric, or duodenal disease, owing to the absence of distinguishing signs and symptoms and the reluctance of the physician to make an unaccustomed diagnosis.

Two cases are reported in which the symptoms of acute pain in the upper abdomen, with rigidity, determined operation. In each the gall bladder and ducts gave no evidence of recent inflammation. Both contained stones. These were removed and drainage of the common duct was performed. The pancreas in both cases was markedly inflamed. Both patients recovered.

These cases of undoubted acute pancreatitis were treated by removal of the cause which, in both cases, was probably obstruction at the papilla of Vater. The rôle of infection could not be excluded and may have played a part, but equally in that case were the measures employed efficacious in removing the cause.

EDWARD L. CORNELL

Sweet, J. E., and Ellis J. W.: The Influence upon the Spleen and the Thyroid of the Complete Removal of the External Function of the Pancreas. *J. Exp. Med.*, 1915, xii, 732.

In the course of studies upon the pancreas in which the external function of the gland was completely removed, either by double ligation of both ducts, cutting and interposing omentum, or by the complete removal of the duodenal portion of the gland, Sweet and Ellis encountered two findings which seemed to them worthy of a brief communication. The first was that a strikingly simple atrophy of the spleen rapidly followed such an operation. The second was that the thyroid apparatus of these animals showed a constant change, evidenced macroscopically by a translucency which might amount to an actual transparency, microscopically by an evident increase in the amount of colloid, chemically by a marked increase of the iodine content of the gland, and physiologically by a greatly delayed appearance of tetany, after the complete operative removal of the thyroids and parathyroids.

Briefly summarized their experiments gave the following results:

1. The complete removal of the function of the pancreas concerned in digestion is followed by marked changes in the spleen and in the thyroid apparatus.

2. The spleen shows an extreme simple atrophy.

3. The thyroid apparatus exhibits a constant change shown by the macroscopic transparency of the gland, by the microscopic increase in the amount of colloid, by the chemical increase of the iodine content of the gland, and by the functional test of

the delayed appearance of tetany after the complete removal of the thyroid apparatus.

GEORGE E. BRILBY.

Copello, O.: Splenectomy in Chronic Anæmias (*Esplenectomía en las anemias crónicas*). *Report. de med. y ciruj.*, Bogotá, 1915, VII, 142.

The author cites a communication by Gilbert, Chabral, and Bernard, in which there was reported a collection of 30 cases, in which were included several pernicious anæmias and hæmolytic anæmias.

The first case of hæmolytic icterus, cured by this operation, was reported by Banti, March, 1911. The case was that of a girl, 20 years old, suffering with pains in the splenic region. The anæmia was shown to be of variable intensity. In 1902, there

was noted a slight icterus; the stools were colored; there was absence of biliary pigments in the urine, but urobilin was present. The base of the spleen was from 6 to 7 cm. below the costal margin, and the patient had a slight fever. The arsenic and iron treatment did not modify the condition; on the contrary, the anæmia became worse. The blood count was: red blood corpuscles 1,605,000; hæmoglobin 25; globular value 0.77; leukocytes 7,065. Moreover, there were found normoblasts, poikilocytosis, red polychromatophil globules, granular erythrocytes (basophiles). Banti performed the splenectomy. The patient improved visibly; after a few days no urobilin was found in the urine; the icterus disappeared, likewise the anæmia. The patient left the hospital after a month, entirely well.

RAOUL L. VIBRAN.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS. CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Lovett, R. W.: The Roentgenographic Appearances in Rickets; a Comment on Differential Diagnosis. *J. Am. M. Ass.*, 1915, LV, 2062.

Between 6,000 and 7,000 roentgenograms were examined for plates of rickets and between 500 and 600 were found; i.e., about 10 per cent of all cases requiring roentgenographic study were cases of rickets.

The plates of rickets were examined from two points of view: (1) to establish and classify the roentgen appearances of the acute, subacute, and convalescent phases of the affection and to define the finer bone changes associated with the disease, and (2) to determine definitely those points in differential diagnosis by which rickets might be distinguished from such diseases as osteomalacia, scurvy, congenital syphilis, and similar affections. On a comparative study of the plates the disease divided itself into three stages:

1. Swelling and rarefaction.
2. Deformity and organization.

3. Healing and reparative eburnation. The knee was chosen as the most favorable joint for study.

The first stage consists of a mild type in which the ends of the diaphysis become frayed out and the epiphysis casts little or no shadow while the center of ossification is small or absent, and at times appears multiple. The whole joint is surrounded by a hazy cloud, and the diaphysis on the whole contains less lime than normal. Up to this point deformities have not begun.

The second stage consists of a severe type in which the epiphyseal changes are more marked.

In the diaphysis severe general bone atrophy exists and there is pronounced periosteal thickening, associated as a rule with fracture of the bones, most often in the arms.

In the third stage the epiphyseal shadow becomes more marked, the area is ragged and irregular about the margin, and there is a characteristic mottled appearance. The ends of the diaphysis begin to broaden, especially on the side on which the strain is greatest, producing a lip next to the epiphyseal line. In bow-legs this is found on the inner sides of both the tibia and femur and in knock-knee on the outer sides of the same bones. This is the beginning of compensatory changes in the bone structure, which from all appearances are related to weight-bearing.

The diaphysis begins to give a more definite shadow. At the end of the diaphysis next to the epiphyseal line there often appears in the late second or early third stage a clear transverse white line showing an increased deposit of lime in the lower end of the shaft. This is equally as characteristic of rickets as it is of scurvy.

Along the shaft of the long bones there is a compensatory cortical thickening on the concave side of the bones. This is of endosteal origin; it persists into the cured stage and is one of the most important characteristics in differential diagnosis.

The smooth homogeneous shadow of normal bone is replaced by an irregularly streaked shadow structure. The second stage in general is a period of systemic reaction to the disease, in which signs of returning ossification occur and deformity begins.

In the third stage the epiphysis begins to resume its normal contour and density. Bone ends are enlarged and there is consequent discrepancy in breadth between the diameters of the diaphysis near the epiphyseal line and the epiphysis. This

relative difference in size is characteristic of the disease. Bone shadows are more definite. The white line becomes more pronounced. There is greater definiteness in the bone shadow of the shaft as well as in the joint and accentuation of the compensatory thickening of the shaft on the concave side of the curvature. The lower epiphysis of the femur seems to be the last to recover its normal outline. The third stage is termed the period of convalescence.

The characteristics of recently cured rickets are the enlargement of the diaphyseal end which is not gradual but is a sudden flaring or lodging next to the epiphysis, the relative disproportion between the diaphyseal end and the epiphysis and the cortical thickening on the concave side of the bone.

In the differential diagnosis of rickets and syphilis the author emphasizes the fact that in rickets the thickening is endosteal in origin and is always on the concave side of the curve, while in syphilis it is periosteal or osteoperiosteal and is very uniformly on the convex side of the curve.

In regard to operation he thinks that no patient should be operated on until the lower epiphysis of the tibia has become rounded with a clear outline.

PHILIP LEWIN

Bérard, L., and Alamartine, H.: Bone Dystrophies Simulating Tumors of Bone (*Les dystrophies osseuses simulant des tumeurs des os*). *Rev. de chir.*, 1913, XLIV, 137.

The authors describe a group of bone lesions which clinically resemble bone tumors. This group was first described by Mikulicz in 1904 under the name of "juvenile fibrocystic osteodystrophy." He described 24 cases. In 1913 Mutel described 84 cases, but the descriptions of some of them are very incomplete. Bérard and Alamartine give the histories of the cases that they consider of undoubted authenticity in which there was a histological examination of the lesions; there are 38 of them, including 3 cases of their own.

These lesions may appear macroscopically as solitary cysts of the bone, exuberant callus, or fibrocystic pseudotumors. They are generally near the epiphysis of the upper end of the long bones. They are not inflammatory in nature, nor are they new growths. They result from disturbances of nutrition in the bone. They appear practically always in children or adolescents. A few cases have first become manifest in adult age, but a careful history reveals the fact that they began in adolescence. The cause is not definitely known. In most of the cases there was a history of traumatism. Insufficiency of the glands of internal secretion, especially the thyroid, also seemed to play a part.

A careful study of the history and a radiographic examination generally make it possible to differentiate these dystrophies from bone tumors, which is of considerable importance as the prognosis and

treatment are quite different in the two conditions. The dystrophic lesions are benign and curable. The treatment consists of as conservative an operation as possible; some cases in fact recover after simple puncture of the cysts and immobilization. The most frequent operation is opening of the cyst and curettage of its walls. Subperiosteal resection, varying in extent with the site of the lesions and the functional troubles produced, may have to be performed. The dystrophies never recur and the functional results of operation are excellent, except in the very few cases where it was necessary to remove a large part of the bone. A. Goss.

Bergel, S.: Treatment of Delayed Callus Formation and Pseudarthroses with Fibrin Injection (*Die Behandlung der verzögerten Callusbildung und der Pseudarthrosen mit Fibrinjektionen*). *Berl. klin. Wchnschr.*, 1913, LIII, 12.

In all inflammatory and febrile processes in which there is a hyperleucocytosis there is also increased fibrin formation. Foci of suppuration, foreign bodies, etc., are enclosed in a fibrous capsule. In the healing of wounds there is a deposition of fibrin, accompanied by leucocytosis, serous effusion, and new formation of granulation and connective tissue. The author has proved that the fibrin is the cause of these healing processes by injecting fibrin under the skin and into muscles, tendons, etc., and bringing about similar processes. He also injected fibrin emulsion under the periosteum of normal bones and found that it produced a callus. The injection of serum of defibrinated blood produced no such result, showing that it is the fibrin that acts on the periosteum in a specific way to stimulate callus formation.

Bier showed that it was the effusion of blood in a fracture that brought about new formation of bone and that when a fracture was sutured surgically and all blood carefully removed healing was very much delayed. He therefore injected blood in pseudarthroses and had good results. It is preferable, however, to use only the active part of the blood, the fibrin. It is prepared from horses' blood and an emulsion made of about 10 ccm. physiological salt solution and 0.3 gm. of the fibrin. This is injected under the periosteum and between the ends of the bones. The bone fragments are then splinted. Sometimes one injection is effective, sometimes the injections have to be repeated every two, three, or four weeks. There is slight febrile reaction and sometimes pain for a short time at the site of injection, but no other ill effects. The author reports 48 cases in which he has used the method. In order to avoid the objection that healing might have taken place spontaneously he waited five to six months or even longer after the injury, though earlier treatment would probably have been more effective. Of the series, 26 show complete consolidation and 10 others progressive consolidation which will doubtless soon be complete. 12 show improvement but not complete consolidation. A. Goss.

Ruth, C. E.: *Bone and Joint Tuberculosis*. Chicago *M. Recorder*, 1915, xxvii, 585.

Physicians as guardians of the public health should stand firmly for the state inspection of all herds of cattle and the destruction of those found to be infected with tuberculosis, since the bovine type of bacillus is an important source of contagion in bone and joint tuberculosis.

The diagnosis of tuberculosis of the bones and joints is often difficult and should not be left entirely to the various tests and X-ray examinations but should include a careful consideration of the clinical history as well.

Incision into a tuberculous effusion leads almost invariably to a mixed infection and should be avoided if possible. Operative procedures of all kinds upon tuberculous joints in children prolong the treatment and give results worse than no treatment at all. The final results of treatment must not be counted in any individual case until the patient has reached the adult age.

The author commends the operative procedures of Hibbs and Albee as distinct advances in the surgery of Pott's disease, but insists that a support should be worn for one to two years to insure fixation of the graft and consolidation of the diseased vertebra. Hibbs' operation seems more suitable in the upper and middorsal regions because of the difficulty of making the processes meet and securing fusion in other parts of the spine.

In hip tuberculosis moderate abduction should always be a part of any form of treatment used, that the tilting of the pelvis, should ankylosis take place, may compensate in a measure at least for the inevitable shortening.

R. B. COFIELD.

Burke, C. B.: *Tuberculin as an Aid in Surgical Tuberculosis*. *Med. Rec.*, 1915, lxxxviii, 1040.

The author states that although Koch's old tuberculin has had the condemnation of many of the profession, he believes that this feeling is largely due to improper dosage and improper selection of cases. Another reason for dissatisfaction with the remedy was that the profession demanded more radical results, even to the eradication of necrotic tissue following the disease.

In surgical tuberculosis especially, the author finds the administration of tuberculin very helpful. The use of Koch's new tuberculin, or "T. R.," beginning with a dose of 1/10,000 mg., carefully increasing to 1/600 mg., and cautiously watching for the slightest reaction, is absolutely necessary for good results.

Tuberculin, as well as general hygienic and dietetic treatments, is especially indicated in tuberculosis of the bones, glands, and skin. Marked fever, hæmoptysis, heart lesions, and marked emaciation contra-indicate its use.

That reaction may be avoided in administering the dose, the author advises the use of a small dose (1/10,000) to begin with, increasing the dose without producing general reaction.

J. H. SHAW.

Witzel, O.: *Preservation of the Wounded Hand* (*Die Erhaltung der verwundeten Hand*). *München. med. Wchnschr.*, 1915, liii, 1701.

Witzel points out the great industrial importance of preserving the function of the hand in every possible case. One of the most important points is to prevent phlegmon. If a wound is thoroughly opened up at first and kept open a phlegmon does not form. The dressings should be put on very loosely and changed every day to avoid accumulation of wound secretion. Bier's hyperæmia is just as essential in preventing the development of a progressive inflammation as antitoxin is in preventing tetanus. When the wound is first attended to all necrotic soft parts should be excised and bone fragments removed under anesthesia. Every day afterward active movements should be practiced on whatever part of the hand is capable of motion. This is best done with the hand in a bath.

Passive movements of the injured part of the hand should be made when the dressings are changed. The movements are not very painful. The pain when passive movements are begun late results from the breaking up of adhesions of tendon sheaths, which should not have been allowed to form. The hand should be dressed in different positions, from complete extension to complete flexion, and the looseness of the dressing will prevent the œdema which occurs when the bandage is too tight.

Elastic traction aids in restoring mobility to fingers that have grown stiff in one position. Diathermia and gentle massage are also of value. All of this treatment must often be supplemented by surgical procedures, such as the incision of scars, removal of bony projections, plastic operations on tendons, etc., followed by thorough medicomechanical treatment.

A. Goss.

Finkelnburg: *Traumatic Sarcoma of the Femur* (*Traumatisches Sarkom des Oberschenkelknochens*). *Deutsche med. Wchnschr.*, 1915, xli, 1501.

Finkelnburg demonstrated before the Medical Society of Bonn a young man of 19 who had been thrown to the ground by a grenade, striking the right leg on a railroad rail. The right thigh was very much swollen after the accident and the skin bloodshot. After the third day the patient went back to the trenches and served four weeks. Then he began to have severe pain in the right leg and was sent to the hospital, where a roentgen examination, taken the fifth week after the accident, showed a swelling of the bone. An osteosarcoma was found on amputation. Lung metastases developed after the operation. That the sarcoma was developed by the accident, from previous embryonic rests, is indicated by the facts that (1) the trauma was a severe one, (2) that the sarcoma developed just at the site of the trauma, and (3) that sufficient time elapsed after the accident for the development of the sarcoma. If the sarcoma had been present at the time of the injury the bone would probably have

been fractured or else the tumor would have grown worse so rapidly that the patient could not have kept up active and strenuous service for four weeks.

A. Goss.

Plisson, L.: Gunshot Lesions of the Diaphyses of the Long Bones (*Les lésions des grandes diaphyses des os longs par coups de feu*). *Lesen chir.*, 1915, vii, 533.

Plisson considers only injuries of the diaphyses of the long bones not complicated by other injuries that threaten life. Only small bullet wounds can be regarded as non-infected; any wound larger than the caliber of a small bullet must be thoroughly opened up; this is particularly true of medium sized wounds, for they are more apt to close up and favor the development of infection in the deep tissues.

All loose bone fragments should be removed, and all attached ones that interfere at all with drainage, many of them are necrotic anyway and do not add to the functional value of the bone, while they increase the danger of infection. The skin incision should be very free so that the wound after treatment is a funnel with the base outward, nevertheless as much tissue should be spared as possible, care being taken to spare nerves and vessels and to remove muscle tissue only when it is hopelessly injured. Sound muscle tissue should be removed only if it is absolutely necessary in order to provide good drainage. If there is no exit wound a counter-opening must be made at the most dependent part; this is especially necessary in wounds of the thigh.

The author recommends systematic posterior drainage in these wounds. Most cases of secondary hemorrhage are due to infection caused by inefficient drainage. Immobilization of the arm and of the leg below the knee is comparatively easy, but complete immobilization of the femur is very difficult and no ideal method has yet been devised. His method is by means of a band of plaster around the thorax and around the leg below the knee, with a board inserted beneath them and passing down the front of the thigh. The patient lies on a table with a reservoir beneath it into which fluids from the dressing run.

At first Plisson irrigated daily with various disinfectants but he found that the action of these solutions was purely mechanical, and now he dresses as rarely as possible, only removing the outer soiled coverings unless there is a rise of temperature, when all dressings are removed and a search made for the cause of the rise. Needless to say the limb should be preserved if possible, but some surgeons have been so conservative in regard to limbs that they have forgotten the greater importance of conserving the life. It is much better to sacrifice a limb that will be useless anyway than to let the patient risk his life to save it. The arm can generally be saved, but there are a considerable number of cases in which the leg must be sacrificed.

A. Goss.

Post, A.: Symmetrical Synovitis in Hereditary Syphilis. *Boston M. & S. J.*, 1915, cxxiii, 937.

The predominant features of this condition as outlined by Clutton in 1886, which are referred to by Post, are the symmetry of the affection, the freedom from pain, the long duration of the symptoms, and the free mobility of the joints throughout the course of the disease. A careful study of syphilitic children shows that the symptoms are comparatively frequent. Radiograms often show changes in the long bones but none in the joints themselves. A diagnosis of tuberculosis is often made and operative measures instituted.

Local treatment of these joints seems to be unnecessary and in many cases harmful by confining the child when it needs fresh air and exercise. The treatment for the constitutional condition includes mild mercurials, the iodides, and salvarsan. The treatment acts slowly and a sudden absorption of the fluid is hardly to be expected. R. B. Corrieo.

Cotton, F. J.: Disinfection of Septic Joints. *Boston M. & S. J.*, 1915, cxxiii, 905.

The author condemns the practice of opening and draining suppurative joints. He particularly advises that an attempt be made to save the joint and obtain useful function by laying the joint wide open, antiseptizing thoroughly, and closing the wound without drainage.

In all septic joints his technique consists in laying wide open the joint, irrigating for fifteen minutes with corrosive sublimate (1:15,000), followed by cleansing with salt solution, after which the capsule is tightly sutured, the external wound is left wide open or nearly so as disinfection of the external soft tissues is not practicable.

Traction on the joint is not necessary as there is no tendency to muscular spasm.

In the closed joints, hip, shoulder, ankle, etc., where the capsule is usually destroyed before the patient is observed, the closure of the joint is not recommended. If the case can be diagnosed early, before the capsule is destroyed, the Murphy formalin-glycerine injections may be tried. J. H. Shaw.

FRACTURES AND DISLOCATIONS

Beckman, E. H.: Correction of Depressed Fractures of the Nose by Transplant of Cartilage. *Surg., Gynec. & Obst.*, 1915, xxi, 694.

The author states that various methods have been tried for correcting nasal deformities, the result of injuries, one of the commonest of which is the transplantation of a portion of bone from the anterior portion of the tibia. While a great deal has been written within the past few years in regard to the transplantation of bone, fascia, and fat, very little has been said in regard to the transplantation of cartilage. Beckman believes that adult cartilage can be transplanted from one portion of the bone to another under the same conditions that bone is transplanted, with good results. The transplanta-

tion of cartilage differs from the transplantation of bone in that it is not necessary to the viability of the transplant that the cartilage should be in contact with other cartilage or with bone, nor is it necessary to preserve the perichondrium in order to secure good results. Several instances are cited in which the adult cartilage was transplanted from the rib into the nose and after two and one-half years there was no apparent change in the size of the transplant.

The technique of the operation is briefly as follows: If the nasal bones are widely separated they should be refractured and a lateral splint placed on each side of the nose to remain for five or six days in order to procure a suitable narrowing of the bridge. When it can be determined that there are no breaks in the nasal mucous membrane and that the circulation about the nose is again normal, a good-sized portion of the cartilage of the seventh rib is removed for the transplant. An incision one-fourth of an inch in length is made transversely through the skin over the nose and just between the two inner canthi at a point where the bridge of the ordinary spectacles rest. With a periosteal elevator the skin and subcutaneous tissues are elevated from the bone and cartilage straight down the bridge of the nose nearly to the tip. The separation should not be carried laterally on either side farther than is necessary to secure room for the transplant which is then slipped into place. Since the tissue has been separated only in the midline the transplant is held in place and is not dislodged to either side. It may be necessary, however, to place a stitch at the upper portion of the transplant to keep it from slipping upward. The small incision is closed with two or three interrupted stitches of horsehair; the wound is sealed with cotton and compound tincture of benzoin applied.

Dwight, K.: Colles' Fracture; Treatment and Results at the Roosevelt Hospital. *Med. & Surg. Report Roosevelt Hosp.*, N. Y., 1915, p. 85.

The number of cases of Colles' fracture treated at the Roosevelt Hospital during the last five years was 444. For the purpose of statistical analysis, 200 consecutive cases of Colles' fracture are taken, representing a period of about 28 months.

The most frequent cause was falling; those falling on the floor, sidewalks, and down stairs amounted to about 70 per cent; 6 cases were due to direct violence. During the same period there were 62 cases of separation of the lower radial epiphysis, and 58 cases of chauffeur's fracture.

The most reliable symptom was that of direct tenderness, consisting of a line of tenderness following and confined to the line of fracture. This was best elicited by making pressure with a lead pencil completely around the radius.

Swelling and indirect tenderness were constant symptoms, but they did not differentiate a fracture from a sprain. Deformity was noted in 54 per cent of the cases, was absent in 23 per cent and not

recorded in 23 per cent. When present, the symptom was characteristic.

The majority of the cases were treated by immobilization by means of a "circular" plaster bandage, extending from the elbow to the ends of the metacarpal bones. This was split along the ulnar margin as soon as it became hard. The average period of immobilization was a little over three weeks. This was followed by massage, passive motion, and baking.

Better anatomical results were obtained in cases which were reduced under an anæsthetic. Radial displacement was not as frequent as dorsal displacement, and it may not be apparent until the dorsal displacement has been corrected.

Anatomical Results	Per cent	Functional Results	Per cent
Good	65	Good	55
Fair (moderate deformity)...	12	Fair (13 slow)	17
Poor (great deformity)...	4	Poor (14 very slow)	3
No record	19	No record	21

The standard for determining the degree of functional result was 60 per cent of combined flexion and extension, 90 per cent in pronation and supination, anything less than this was considered a poor result.

Attention is directed to a class of cases which Dwight designates as trophic. These cases are characterized by a great deal of swelling, shiny skin, and flexed fingers; usually occurring in women past middle life. The swelling may do damage by causing constriction, either by the splint or by tense skin, which cannot stretch enough to relieve the pressure.

Time is the only factor in treating these cases, massage and traumatism of the joint is to be avoided; they will become normal in about a year or less.

D. L. DESPARD.

Giles, G. M.: A Splint for Compound Fractures of the Arm. *Brit. M. J.*, 1915, ii, 811.

Giles had a patient who sustained a compound fracture 5 inches above the elbow; it was almost well when he stumbled, sustaining a refracture and tearing open the nearly healed wound. Being unable to keep the fragments in apposition, he devised a wire and tin splint. The wire begins at the knuckles, runs up on the flexed forearm to the insertion of the biceps, is there bent at a right angle, is carried up the inner side of the arm to the anterior axillary fold, where it is then bent to fit the arm around internally to the posterior border of the deltoid and is carried up over the acromion and forward for 1.5 to 2 inches, curving back, the wires are about 1 inch apart, carrying it down the back of the arm to the elbow, bending to a right angle and along the under side of the forearm and across the palm the two ends of the wire are fastened together. The splint is completed by bending two pieces of tin to fit the arm and forearm respectively and fastening them to the wire frame; the angle at the elbow and the extension up to the acromion are left open. Straps of wicking extending from the upper tip of the splint and

the anterior axillary angle serve to fix it to the body. A very little bandaging of the upper arm keeps the fragments in position. The patient can be up and about, the weight of the arm serving for continual extension.

C. A. STONE.

Eyles, F.: Fracture of the Bones of the Foot from Marching (Die Marchfraktur). *Menschen und Wunden*, 1913, III, 4703.

The swelling of the middle part of the foot, so often observed in soldiers, was formerly thought to be an affection of the soft parts, but later Pausan and Poulot thought it an osteoperiostitis caused by severe weather. Since the introduction of roentgenography it has been found that the swelling is due to fracture of the bones of the foot. The soldiers march carrying a weight of about 80 pounds. Herhold has shown that the metatarsals of corpses will break under a burden of 50 pounds. The fracture is generally in the distal third of the second or third metatarsal.

In fractures without dislocation it is generally sufficient to place the bone at rest with firm adhesive plaster strips. This avoids excessive callus formation and the displacement of the fractured ends. The bone is sufficiently splinted by the neighboring metatarsals. In fractures with marked dislocation of the fragments Bardenheuer's extension is indicated.

A. Goss.

Finsterer: Nail Extension in Fracture of the Femur (Nagelextension bei Oberschenkelbrüchen). *Wien. Klin. Wochenschr.*, 1913, XLVII, 1307.

Extension treatment of fractures of the femur is only successful when it is applied early before there is any contraction of the soft parts. The wounded do not reach the hospitals in the interior until three or four weeks after they are injured, so that successful extension treatment is impossible. Shortening is very frequent after fracture of the femur, even when it has healed without infection. Therefore the author has recently been using nail extension in these cases, because with it shortening can be overcome even after four weeks, he demonstrated two cases to illustrate this. He thinks it advisable for the hospitals in the interior to use nail extension more frequently than they have been doing, as it would restore the patients to capacity for military service in many cases.

In the discussion Ranzi said that in his clinic nail extension was only used in cases where other methods of extension had failed, but that it had proved very useful in stubborn cases. Finsterer replied that unfortunately in many cases the patients refused osteotomy. He had seen 40 to 50 cases with shortening of 5 to 10 cm. which could have been corrected very readily by osteotomy and nail extension, but all but one of them refused the operation, as their disability enabled them to avoid further military service and to draw a permanent pension from the government.

A. Goss.

Hayes, W. B.: An Adjustable and Standardized Splint for the Treatment of Fractures. *Ann. M. J.*, 1913, II, 812.

Hayes describes a converted Thomas Knee-brace. The truss ring of malleable iron is open in front, and has two tubes attached, with rubberine play to permit the ring to be adjusted to either thigh. The lower portion of the splint is a bent iron rod, the arms of a size to fit into the tubes attached to the truss ring. Set screws permit shortening and lengthening. To the lower end of the splint is fastened a rest, which when turned down permits the limb to be left at any angle. The great advantage is that it permits of free transportation and dressing without disturbing the fracture.

C. A. STONE.

Martin, S. P.: End-Results in 242 Cases of Simple Fracture. *Surg. Gynec. & Obst.*, 1913, vol. 177.

In most hospital statistics, and too frequently in those of private practice, histories of simple fracture of the femoral shaft include only the cause, nature, and symptoms of the injury, deformity at the time of admission, method of treatment, and date of the patient's discharge with firm bony union. At this time the word "cured" is simply noted on the discharge blank with no mention in most cases of the amount of deformity or limitation of motion. In reality the forty-ninth or fifty-sixth day when the adult leaves the hospital on crutches, in the majority of instances utterly crippled as far as the regular pursuit of his vocation is concerned, signifies the time at which his troubles begin.

The records of these cases are not to be found in a study of surgical literature. We have become so habituated in the word "cure" in regard to fractures denoting union that we have unconsciously accepted the doctrine that all simple fractures of the femoral shaft are cured in six to eight weeks. In the hope of determining with some degree of accuracy the ultimate prognosis of simple fracture of the femoral shaft the records of seven leading Philadelphia hospitals for the period from 1904 to 1913 were examined. The list of cases thus collected numbered 400. An effort was made to look up each patient at his home, but it was possible to obtain the end results of 242 cases only.

All cases except children under one year of age were treated by extension, secured by weights attached to the leg and thigh by adhesive straps, the foot of the bed being raised to secure immobilization. The weight in most cases ranged from 5 to 25 pounds. Sandbags were used to immobilize the parts. Children under one year were either treated by plaster-cast or by extension with a pulley attached to framework over the bed.

The author's conclusions are:

1. In children fracture of the shaft involves mainly the middle third.
2. Ninety per cent of all cases occurring in children are followed by complete recovery.

3. In children at the time of discharge from the hospital (8 weeks) there is no stiffness in the knee.

4. The average period of treatment of children is two to three months.

5. In adults fractures of the shaft of the femur involve mainly the middle third.

6. Between the ages of 13 and 25 years there are about 50 per cent of complete recoveries, while after 25 years permanent disability is proportionate to the age of the patient. Men above 40 years rarely regain their original strength and activity.

7. In adults in the absence of shortening there may be lasting weakness of the leg and thigh. Permanent disability is as a rule associated with shortening and varies with the degree of shortening.

8. The average period of treatment in adults is eight months.

9. In adults, at the time of discharge (eight to ten weeks) there is stiffness of the knee in 100 per cent of cases.

10. Among adult laboring men 90 per cent never become able to work at their regular occupations.

Gilbert, J.: Dislocation of Elbow-Joint and Flexed Ankylosis of the Knee-Joint. *TEXAS M. J.*, 1915, XXVI, 226.

The author cites a case of dislocation of the elbow-joint which had existed three months. The injury had been diagnosed and treated as a sprain.

Gilbert operated, using an external incision. Reduction was attempted but found impossible, but after cutting off the head of the radius and part of the olecranon process reduction was obtained. Murphy's method of dissecting a flap of fat and fascia and placing it between the bones was used, after which the arm was dressed and placed in a flexed and supine position. On the seventh day slight passive movements were begun. The patient regained good use of the arm.

The points emphasized in this case are the importance of X-ray examination in all sprains, and the advisability of trying to obtain good function in joint ankylosis by the use of operative measures.

A case of flexed ankylosis of the knee-joint is cited, in which the patella was ankylosed to the lower end of the femur, after having been torn from its tibial insertion two years previously. The author removed the patella; the ankylosis was broken up, the surrounding fat and fascia was transplanted, and stitched between the bones. The patient is now able to extend the limb and has fairly good knee action.

J. H. SHAW.

Blanchard, W.: Structural Changes in Congenital Hip Dislocation. *J. Am. M. Assn.*, 1915, LXV, 1805.

The author finds that roentgenograms offer suggestions as to the proper position the limb should be held in the plaster-of-Paris spica to hold the head of the femur in the acetabulum and insure a good functional joint. Even the flat head with shortened neck if held where the acetabulum should be, causes, with proper care, a new building process

which leads to the formation of a new joint. From three to five years may be taken as the best time for reduction and with 2.5 to 4 cm. shortening.

Coxa valga and shortened and twisted neck, though unpromising in appearance, may allow of reduction and an ultimate functional result. As the frequent changing of position of the leg as advised by Calot interferes with the proper rebuilding process of the joint, it is advisable to hold the leg in abduction at least eight months, as this is the shortest time in which a dependable acetabulum re-forms. In several cases the author has found it necessary to remove casts soon after reduction for one or two months with the patient in bed suffering complications such as diphtheria, etc., without redislocation taking place.

H. W. METERING.

Largent, B. F.: Separation of Lower Epiphysis of Tibia. *TEXAS M. J.*, 1915, XXV, 232.

Separation of the lower tibial epiphysis occurs between the second and eighteenth year, and is due to some strain producing an eversion of the foot, such as a violent fall. It gives symptoms of eversion of the foot with prominence upon the inner side of the ankle of the sharp lower edge of the diaphysis, tenderness, and crepitation. Treatment is immobilization.

The author cites a case of two weeks' standing, showing pain and swelling over the epiphysis. A cast was applied but gave no relief from pain. On further examination no deformity was found, but considerable pain, swelling, and disability were present. Incision revealed a wide-spreading, low-grade infection which finally yielded to drainage. The case was an epiphyseal separation plus a low-grade infection.

R. G. PACKARD.

SURGERY OF THE BONES, JOINTS, ETC.

Frank, J.: The Use and Abuse of Lane Plates. *Surg., Gynec. & Obst.*, 1915, XXV, 783.

The author pleads earnestly for conservatism in the treatment of fractures and deprecates the *furor operativus* which seems to permeate this branch of surgery. His study of the literature reveals the following facts:

1. Fixation of fragments by plates is not always obtained, as an aseptic rarefying osteitis often loosens the screws.

2. Plates, instead of acting as a scaffolding for new bony growth, often cause destruction of the adjacent osseous tissue.

3. The primary firm fixation secured by plates not only does not stimulate osteogenesis but is a distinct hindrance to new bony growth.

4. Persistent sinuses and stiffness in neighboring joints subsequent to bone-plating are not at all infrequent.

5. From an economic standpoint, operative treatment does not enable the patient to return to his vocation sooner than with conservative treatment.

To the development of roentgenology and its



Fig. 1. Median incision down to the bone; the rugine has detached the muscular lip and lifted up the internal part of the tricipital insertion. (Mouchet and Gouverneur.)



Fig. 2. The surfaces to be resected have been freed from soft tissue, and the scissors, at the line of articulation, are beginning to cut the ankylosis. The dotted lines on the humerus and bones of the forearm indicate where the bones are to be cut off. (Mouchet and Gouverneur.)

application to this branch of surgery, the author attributes much of this excessive operative zeal. An X-ray plate may show an apparently poor anatomical result. Such is not incompatible with a good functional result. However, this phase is many times passed by and undue importance attached to the outlines in the X-ray plate. As a result operative methods are indulged in, and only too often to the detriment of immediate firm union and a good ultimate result.

The author cites two cases in which he obtained good functional limbs with conservative methods (limb had to be resperated upon, but no foreign bodies were introduced) following extremely poor results subsequent to the application of the plating method.

Mouchet, A., and Gouverneur, R.: Resection of the Elbow for Ankylosis from War Injuries (*De la résection du coude dans les ankyloses par blessures de guerre*). *J. de chir.*, 1913, xii, 329.

In many cases of ankylosis of the elbow-joint resection is indicated. If the wound is completely healed and the ankylosis is at an obtuse angle operation is clearly indicated. If the ankylosis is at a right angle various factors must be considered. If the hand is in extreme pronation it is quite useless and operation is indicated. Nerve lesions often accompany the injury.

If the injury is recent, operation is indicated and the nerves may be freed at the same time, if six months or more has elapsed since the injury was sustained and trophic disturbances have already begun it is too late to restore mobility to the joint. If the joint is ankylosed at a right angle and there is no other lesion the indications depend on the patient's occupation and the condition of the muscles. If the muscles have undergone a great degree

of atrophy operation is useless. If the muscles are in normal condition, and if the patient is young and his occupation demands free use of his elbow-joint operation is indicated. If there is a fistula but the suppuration has been reduced to a very slight discharge and X-ray examination shows only a small zone of osteitis that can readily be removed operation should not be delayed to wait for complete healing, as the muscle atrophy increases during the delay, but if there is a free discharge and a considerable area of osteitis operation should be delayed.

In most cases the resection should be total, the ends of the humerus and both bones of the forearm being removed. As a general rule about 4 cm. should be resected, though of course the extent of the resection will vary in different cases. This free resection is necessary in order to get a mobile nearthrosis. There is danger of a return of the ankylosis if the resection is too conservative, but it is also necessary to secure a solid new joint, and for this reason the resection should be subperiosteal, the muscles being freed from the bones with a rugine with the greatest care and without cutting their insertions, for the muscles play the part of ligaments in the new joint and all their anatomical connections should be preserved. The joint should be in such a position that all the steps in the operation can be taken without moving it. This is best accomplished by having the arm thrown back toward the head with the palm resting on the table, so that its posterior face is upward. A median posterior incision is made, the middle of it being over the joint. The muscles should be removed from the bones methodically, beginning with the triceps and ending with the lateral muscle groups. It is best to cut the ankylosis with strong scissors, and then saw off the ends of the bones at the points indicated. The fibromuscular walls of the cavity



Fig. 3. Appearance of the cavity formed by the bone resection when the forearm is extended on the arm. (Mouchet and Gouverneur.)

left by the removal of the bones should be examined to see if they contain any splinters of bone that might give rise to new bone formation. The walls should then be touched with a strong solution of carbolic acid, a drain inserted, the muscles brought together properly and sutured with catgut. The arm should be dressed at an angle of about 45 degrees; the tonicity of the muscles will gradually bring the bones together and a new serous membrane will be formed between them. The after-treatment is quite as important as the operation. The drain should be removed on the fourth to the sixth day, and within a few days light massage should be begun. For ten to fifteen days there will be an increase in the atrophy of the muscles. This is due to the inevitable traumatism of the operation, and that is why the subperiosteal method is so important, as it involves the least possible traumatism. Early light massage tends to counteract this atrophy.

Movement should be begun very early, generally on the ninth or tenth day, the movements being very gentle and slight at first and increasing in force and amplitude. Generally the patients are sent to a service for mechanotherapy on the fortieth to forty-fifth day. The authors have never interposed any material between the bones, such as muscle, fat, or fascia, as some authors recommend. They believe that free resection will prevent reankylosis and that the introduction of any tissue with decreased vitality increases the danger of infection.

They give the histories of 18 cases in which they have resected the elbow for ankylosis. In 8 the results were excellent; the movements are forceful and practically normal in extent; the patients have resumed their occupations. There are only slight lateral movements when the arms are at rest, and they disappear completely when they are in motion. In 7 cases the results were good. Extension is not complete, and a lateral movement decreases the force somewhat, but not enough to interfere with their work. In one case the results cannot be judged



Fig. 4. Roentgenogram of the resected elbow. In front of the coronoid process and at the level of the epitrochlear may be seen dark spots, due to bits of bone included in the fibrous periarticular tissue and the insertions of the muscles. These bony protuberances limit extension. (Mouchet and Gouverneur.)

because of involvement of the median and ulnar nerves. In two cases the results were only mediocre; free lateral movements and atrophy of the muscles make it necessary for the patients to wear an apparatus. A. GOSS.

McWilliams, C. A.: A Further Study of Bone-Grafting. *Long Island M. J.*, 1915, ix, 485.

In the 36 cases operated upon by the author all bone-grafts which had a covering of periosteum lived, excepting one. But 21 grafts without periosteum lived out of 38 cases. The author believes that an autogenous graft with a covering of periosteum should be used, the success of which is dependent upon a good blood-supply. He reports one interesting case in full. JAMES R. MARTIN.

Ullmann, E.: Autoplastic Bone Transplantation (Autoplastischer Knochentransplantation). *Wien. klin. Wchnschr.* 1915, xxviii, 1352.

Ullmann demonstrated a case of autoplastic bone transplantation with good functional results before the Medical Society of Vienna. The middle third of the ulna was crushed December 23, followed by suppuration and the discharge of bone fragments till February 16, when the necrotic bone fragments and the jagged ends of the bone were removed. In June after the wound had healed a piece of tibia was transplanted into the ulna. Healing occurred by first intention. Pronation and supination which had been imperfect before, became normal, and also

flexion of the hands and fingers. The interposed piece of bone can be clearly seen in the roentgen picture. In connection with this Ullmann pointed out the fact that there is frequently a great discrepancy between the radiological findings and the functional usefulness of the limb. Lesions can often be seen in the roentgen picture that do not cause any functional trouble at all. Too pessimistic conclusions as to function should not be drawn from the roentgen picture, even when there is displacement between the fractured ends.

A. Goss.

Phemister, D. B.: Fascia Transplantation in the Treatment of Old Fractures of the Patella. *Ann. Surg., Phila.*, 1913, 55, 746.

In old fractures of the patella with the fragments separated, the joint cavity extends forward between and in front of them, the quadriceps contracts and atrophies, walking is difficult, any motion requiring complete extension is impossible. Some operators in attempts at repair remove the lower fragment with the tibial tubercle and attach it to the upper one, others have used various plastic flaps to bridge the space between the two pieces. Phemister reports a case which had been treated for eight weeks with a posterior splint by the patient's physician, and the patient still being unable to walk, a short posterior splint was worn for two months more, when he could walk with a cane, but at times the knee gave way under him suddenly. A 7-inch longitudinal incision was made over the front of the knee. The contracted lateral ligaments held the upper half three finger's-breadth from the lower and on incision followed by strong downward traction there remained a 1-inch space between. To bridge this, a piece of fascia lata was sewed to the quadriceps above, to the patellar tendon below, and to the remains of the lateral ligaments on each side. The wound healed promptly. A plaster cast was worn four weeks; the man then walked with a posterior splint for four weeks, since then without support. Extension was almost complete, flexion 45 degrees. Eight months after operation flexion had increased to 90 degrees. He has been at work for the past three months.

C. A. Sprue.

Hartman, W. L.: When, Where, and How to Amputate; Treatment of Gas Bacillus Infection. *Am. J. Surg.*, 1913, 213, 451.

Hartman says that his own experience and that of others has impressed upon him the fact that we are in the habit of waiting too long before amputating. He favors early amputation. The amputation should be made as soon after the accident as it is possible to transport the patient to the most suitable place available for the work. The rule that most surgeons follow is to wait until the patient recovers from the shock of the injury, in the belief that immediate amputation would add greatly to the shock already existing. The author claims that early

amputation reduces the shock by controlling all hemorrhage, especially the oozing from bruised tissue. He also says that early amputation removes a source of great danger, viz., infectious matter incorporated in the wound.

He advises the following procedure:

1. Control shock. Give morphine hypodermically in one quarter grain doses as often as necessary to put the patient under its influence.
 2. Control hemorrhage.
 3. Apply heat to the body.
 4. With all possible speed move the patient to the place where amputation may be done with greatest safety.
 5. Use normal saline solution either by hypodermoclysis or by proctoclysis for extensive hemorrhage, preferably the latter method. When there has been a moderate loss of blood a larger amount of the solution may be given with tolerance than where there has been profuse hemorrhage. Never give more than one pint at first. He advises giving one-half pint every two to four hours, the first dose given by hypodermoclysis, the other by proctoclysis.
- In an amputation below the knee the weight of the body is supported by the tuberosities and the center of the middle third is the best site for amputating. If four inches can be saved below the knee-joint a very good stump will result.

Hartman suggests the removal of the fibula to obviate the discomfort produced by the pressing together of the two bones and to produce a better surface at the tuberosities. Notwithstanding the fact that many surgeons emphasize the danger of stump shrinkage, in the author's opinion the more rapidly this very shrinkage can be brought about, the less time it will take to fit the patient with a comfortable artificial leg.

When the amputation is done above the knee, however, it is more desirable that there be no shrinkage. Care must be exercised in applying the tourniquet as nearly to the site of amputation as possible. The scar line should never come in the center of the stump if it can possibly be avoided. It is always better to make a long anterior and a short posterior flap.

The author considers it unnecessary to leave drainage in a stump more than forty-eight hours, in the majority of cases not more than twenty-four hours. He recommends very highly the use of a gutta-percha tissue soaked three or four times.

For the treatment of a gas bacillus infection he recommends:

1. Free incision of the infected area.
2. Injection of oxygen into the invaded and surrounding tissue.
3. The application of peroxide and leaving the wound absolutely exposed to the air.

Where the infection has been progressing rapidly amputation should be made well above the involved tissue, the wound left wide open, the stump bathed in peroxide, no dressing, a continuous stream of oxygen playing into the wound, oxygen injected

into the tissues above the amputation, and 3 to 4 ounces of whiskey internally every two hours.

PHILIP LEWIN.

Tuffier: Functional Value of the Stump After Amputation [De la valeur fonctionnelle des moignons après les amputations de guerre]. *Bull. Acad. de méd., Par.*, 1915, lxxiv, 786.

A second operation has to be performed in a great many amputation cases. Ninety per cent of these secondary operations are on the lower limb. The best prophylactic measure is early and thorough disinfection of wounds. Wrong methods of operation and insufficient after-treatment are responsible for a certain number of these secondary operations. In the lower limb the flap method should be used instead of the circular method, for it gives a more supple scar and one which is not located at the end of the stump. Elastic traction on the soft parts after operation will prevent a large percentage of vicious healing; pain due to the inclusion of nerves may be avoided by a little care in cutting the nerves high up. Terminal osteomyelitis, which frequently necessitates a second amputation, is due to persistence of the original infection.

Disarticulation at the hip-joint gives favorable results for the wearing of an artificial limb. Subtrochanteric amputation in the upper fourth of the femur makes the adaptation of an artificial leg more difficult, but it is a less serious operation than disarticulation. A stump less than 10 cm. long is of no use as a lever in walking. A posterior scar is much better than the scar from a circular amputation with reference to fitting the artificial leg, but the flap method necessitates cutting the bone higher up and thus shortening the stump. If the flap method does not change an amputation in the middle third into one in the upper third it should be given the preference over the circular method. Intracondylar amputations give good results, while disarticulation of the knee does not. Amputations below the knee should be as low down as possible. If it is necessary to amputate in the upper fourth the leg should be removed as near the knee as possible, for the stump is useless and dangerous. The scars of amputations below the knee have given very bad results. The circular method should be entirely abandoned; a posterior flap is the best. Tibiotarsal disarticulation and intramalleolar amputation enable the patient to walk with very little limping. The same is true of Lisfranc's and Syme's amputations; but Chopart's amputation almost always necessitates secondary operation and should be used only in exceptional cases.

Secondary amputations are the exception in the arm, so the aim here is to preserve as much of the limb as possible. Intraclavicular amputation is much preferable to disarticulation of the shoulder for it makes the application of an artificial arm much easier. The circular method is preferable in the arm, because the terminal scar does not have to bear any weight. In the forearm it is especially

important to keep as long a stump as possible. A difference of three or four centimeters is of the greatest importance in the function of the forearm. At the wrist a palmar flap is preferable to the circular method. In any amputation it is of great importance to preserve the function of the adjacent joint by early mobilization.

A. Goss.

Eloesser, L.: Amputations and Their After-Treatment. *Calif. St. J. Med.*, 1915, xiii, 459.

The author draws the following conclusions:

1. Amputation wounds should be drained.
2. The most rigid asepsis should be exercised.
3. Freedom from post-operative pain and relief from tension should be obtained by adhesive plaster traction.
4. In septic amputations the cut should be made straight through close to the infected area and the stump should be taken care of secondarily by the proper re-amputation.
5. The final result should be a painless end-bearing stump.
6. Pain in the stump is due to neuromata, periosteal irritation, or to a weight-bearing scar.
7. Neuromata may be avoided by a high section of the nerve.
8. Painful neuromata should be permanently blocked above the neuroma by an alcohol injection.
9. Periosteal irritation is avoided by: (1) epiphyseal amputation, (2) osteoplastic procedure, (3) ex-articulations, and (4) aperiosteal amputations.
10. Atrophy of the muscles of the stump is avoided by suture of the opposing tendon groups.
11. End-bearing should be secured by early massage, early use of the stump, and by early application of the artificial limb.

G. I. BAUMAN.

ORTHOPEDICS IN GENERAL

Katzenstein, M.: Treatment of Beginning Flat-Foot (Ueber die Heilung des Plattknickfusses). *Therap. d. Gegenwart*, 1915, lvi, 462.

The primary defect in flat-foot is a weakness of the ligaments; changes in the position of the bones are secondary. In the beginning stages it is the tibionavicular ligament that is involved and the foot bends outward, the distance between the tibia and the scaphoid becoming greater than normal. Gradually the bones of the arch sink down and we have complete flat-foot.

In the early stages when only the tibionavicular ligament is involved the condition may be corrected by injecting about 0.5 ccm. of a per cent formalin solution into each side of the ligament at various points. This is done under local anesthesia, and a small dose of morphine may be given. The formalin hardens and tans the ligament, so that it shrinks. After the injection a plaster cast is worn for a month. At the end of this time the position of the foot is entirely normal and no sort of plate for flat-foot needs to be worn.

It should be the aim of orthopedic surgery to dispense with the use of all sorts of external apparatus. Thus far Katsenstern has never used the method described in more advanced cases where more deep-seated ligaments were involved, but he is now carrying on anatomical studies that he hopes will enable him to utilize the method in these cases also.

A. Goss.

Marshall, H. W.: Foot Strain and Other Common Foot Defects. *Boston M. & S. J.*, 1915, CLXIII, 979.

After commenting on the frequent disappointments in the ordinary methods of treatment of common foot troubles, Marshall gives a new classification and elaborates some sound principles for the management of hard cases. His grouping includes: (1) simple relaxations and strains; (2) rigid flat-foot and allied conditions; (3) foot-strain in other pathologic states, and (4) miscellaneous lesions associated with foot-strain. He cites many cases under these divisions, and shows some fine photographs to illustrate his points.

In treating the strains, he emphasizes that too much trust should not be put in any element, such as the plate, but supplementary exercises, flexible shoes, etc., should be considered. Too abrupt and

sudden changes in the foot wear should not be made, but it must be borne in mind that feet vary greatly in shape and size, and that bad deformities will often show no symptoms, while often with no deformities symptoms will be intense. The cause of rigid flat-foot is not known, although often the condition of the circulation is a big factor in addition to the strain. Other pathologic states causing foot troubles may include infantile paralysis, arthritis deformans, old fractures, carpal-taral trouble, hallux valgus, and poor posture, and should be treated as such. Also spurs of the os calcis, hypertrophic bone changes, and chronic inflammatory skin diseases may produce foot ailments.

The author urges conservative treatment, and concludes that the routine use of any one device should be avoided, but that any alterations must gradually be made, and the use of plates, straps, and flexible shoes gradually discontinued. Tonic-eliminative measures are all important in addition to mechanical treatment. Anatomic features, as flat-foot or hallux valgus, must not be overestimated, nor functional features underestimated. The only fixed principle in regard to supports is to determine and to prescribe the adequate minimum support for relief of symptoms.

R. G. PARKARD.

SURGERY OF THE SPINAL COLUMN AND CORD

Bonnus, G.: Radiotherapy in Spastic Affections of the Spinal Cord from War Injuries (*La radiothérapie dans les affections spasmodiques de la moelle par blessures de guerre*). *Paris méd.*, 1916, VI, 32.

Bonnus gives the details of 11 cases in which he used roentgen therapy for spastic affections of the spinal cord resulting from war wounds. He used a filter 1 mm. thick, and the distance of the anti-cathode from the skin was never more than 15 cm. One to one and one-half H was applied at the lesion. The number of applications varied from six to nine for each patient, one's week being given. Sometimes quite pronounced effects were observed after the first treatment. The results were best in the injuries of the cervical cord and poorest in the lumbar cord, though there was improvement in all cases.

The poorer results in the lumbar cord may have been due partly to defective technique, as these were the first cases treated, but partly doubtless to the greater amount of exudate, as the spinal canal is larger in the lumbar region. The time since the injuries varied from two to eleven months, and in none of the cases was there any tendency to spontaneous recovery before the application of radiotherapy. There was improvement not only in the spastic phenomena, but in the intense pain caused by inflammation of the nerve-roots. He has also had good results in the treatment of painful neuritis of the median with radiotherapy.

A. Goss.

Saenger: Tumor of the Spinal Cord Treated with Roentgen Rays (*Mit Röntgenstrahlen behandelte Rückenmarksgeschwulst*). *Deutsche med. Wochenschr.*, 1915, XLI, 1586.

A 41-year-old woman had had rheumatism in 1911 and in 1913 came to the hospital for pains in the sacrum and various symptoms that gave the impression of hysteria. After a year of hospital treatment she complained of pain in her head and neck and a feeling of lameness and uncertainty in her legs. The possible diagnoses were multiple sclerosis, compression myelitis, and tumor of the spinal cord. Saenger decided in favor of the latter and localized the tumor at the fifth dorsal vertebra where it was found on operation. When the dura was opened, dark, soft spongy masses protruded. They extended into the cord substance and only the extramedullary part could be removed. The dura was closed with catgut.

After the operation the pain in the neck and upper part of the dorsal cord improved, but complete paralysis of the bladder occurred. As the prognosis was very unfavorable on account of the intramedullary tumor, the patient was sent to the roentgen institute where she was given roentgen treatment. The result was astonishing. The patient can not only walk alone but can climb stairs if supported. Her general condition is good and the pains have stopped. This is not only a brilliant operative result but it shows the good effect of roentgen rays in intramedullary tumors.

A. Goss.

O'Ferrall, J. T.: **Fracture Dislocations of the Cervical Vertebrae.** *N. Ost. M. & S. J.*, 1913, lviin, 385.

In fracture dislocations the type of lesion so commonly seen and least frequently recognized is that of unilateral rotary dislocation with fracture. The symptoms resulting from upper cervical injuries vary from instant death to very mild symptoms, such as neck rigidity, pain, and asymmetry of the head.

The spinous processes may be found out of line. The most important points of diagnosis are:

1. The position of the head, the chin pointing away from the main lesion.
2. The position of the transverse process of the axis.
3. The results of the digital examination of the pharynx.
4. The lateral and anteroposterior radiographs, the latter taken with the mouth as wide open as possible.

As to the treatment, if the surgeon can thoroughly convince himself that he is dealing with a simple unilateral subluxation, intelligent manipulation may be done with perfectly safe results. If complete reduction fails and there are no symptoms of cord pressure, a Minerva jacket with the head held in full extension should be applied and worn for six weeks to two months. If trouble continues after this a permanent apparatus should be worn.

G. I. BAUMAN.

Albert, H.: **Chordoma, with the Report of a Malignant Case from the Sacrococcygeal Region.** *Surg., Gynec. & Obst.*, 1915, xxi, 766.

The author reports a case of a very rare tumor, only 16 of the kind having been reported to date. The tumor was composed of notochord structure

and must have had its origin from remains of this primitive axial skeleton.

The case in question occurred in a man 36 years of age. Traumatism appeared to play a rôle in the causation of the neoplasm. The tumor was located in the posterior wall of the lower part of the rectum and was not adherent to the coccyx nor to any other portion of the vertebral column.

The principal symptoms were pain in the rectum and difficulty of defecation. Two operations were performed to remove the tumor, and a third one—a colostomy—to give relief to the patient after the recurring process had extensively infiltrated the surrounding tissue.

The patient died fourteen months after the tumor was first recognized. No autopsy was secured.

The tumor, at the time of the first operation, measured 5.5 cm. x 4 cm. x 2.5 cm. It was soft in consistency and was light in color. The microscopic picture which was striking and characteristic, showed that the tumor consisted essentially of large vesicular cells which tended to break up, forming a foamy substance.

The tumor was distinctly malignant, as shown by the infiltration of surrounding tissue and the clinical course.

It is believed that the influence of the traumatism was to stimulate to growth, a rest of notochordal structure which had been displaced during the period of fetal development.

Of the 16 cases reported, 10 had their origin from the base of the skull in the region of the sphenoccipital synchondrosis and 6 developed in the sacrococcygeal region.

Of the 16 cases reported, 10 were pathologically malignant and 6 benign, although some of the latter caused death by virtue of their location. Of the malignant ones, 6 had their origin from the base of the skull and 4 from the sacral region.

SURGERY OF THE NERVOUS SYSTEM

Delorme: **Injuries of Nerves by Projectiles, Especially Injuries of the Sciatic** (*Sur les blessures des nerfs par les projectiles et en particulier sur les blessures de sciatique*). *Rev. de chir.*, 1915, xxxiv, 402.

Delorme discussed the above subject before the Paris Surgical Society, basing his conclusions on a large number of cases that he had had occasion to operate upon. He is an advocate of operation after cicatrization of the wound, especially in cases where paralysis begins at once and does not show improvement. When the incision is made the ends are generally found several centimeters from each other, a large neuroma occupying the intervening space. In these cases he sections the nerve beyond the neuroma, brings the ends together and sutures them. In some cases there is cicatricial adhesion

of the nerve to neighboring parts, but no break in the continuity of the nerve.

He explores carefully till he finds the limits of the lesion, excises the cicatricial tissue and sutures the freshened ends of the nerve together. In some cases of contusion of the sciatic that give rise to persistent pain, localized adhesions are found, but sometimes, even when the pain is intense, no visible lesion can be discovered.

In the discussion Gosset said that he had performed 60 operations for wounds of the peripheral nerves. He believes that every time an injury of a peripheral nerve is diagnosed an exploratory incision should be made, so that the lesion can be observed directly. This exploratory incision should be made within two or three weeks after the injury.

ROUTIER expressed surprise at the number of

operations performed by Delorme, and at the fact that he applied the same treatment to all cases. He has only operated in three cases.

Lefort pointed out that there are two objections to early operation in nerve injuries: persistent supputation and the difficulty of making an exact diagnosis of the nerve lesion. He advocates exploratory incision.

Dezaki expressed surprise at the large number of operations performed by Delorme, and at the fact that he seemed to have sacrificed the nerve trunk without having any exact information as to its anatomical condition or its physiological value.

Quinay declared that it was impossible to recognize with the naked eye whether the nerve was intact and to determine the anatomical value of a nerve cicatrix.

A. Goss.

Mueller, E.: Treatment of Paralysis of the Radial Nerve (*Zur Behandlung der Radialislahmung*). *Pres. 2. Klin. Chir.*, 1915, xxviii, 263.

Mueller describes two cases in which the function of the radial nerve was restored after nerve-suture. In one of the cases there was an interval of eleven months after the operation before the nerve began to show signs of returning function; after that the restoration was very rapid. It has generally been assumed that if function is not restored by the end of six months it will not be. This case shows that it may be restored after that time and therefore no supplementary operation should be performed that will interfere with nerve function if it is restored.

The radial innervates the extensors of the hand and fingers. When the radial is paralyzed and an attempt is made to close the fist the wrist is flexed also and this interferes with the closing of the fist. In treatment therefore the flexure of the wrist must be prevented. Mueller recommends that this be accomplished by the transplantation of a strip of fascia lata. The technique is as follows:

A longitudinal incision is made in the middle of the extensor side of the forearm extending over the middle three-fifths of its length, another in the middle of the back of the hand, a third along the metatarsal of the thumb. The skin and subcutaneous tissue is loosened up on both sides of these incisions and under the bridge between the incisions on the forearm and hand. A strip of fascia lata 20 to 25 cm. long and 5 to 6 cm. broad is transferred to the arm. It is drawn under the bridge of skin and fastened first at the back of the hand, and then after the hand is placed in a position of marked dorsal flexion it is sutured to the forearm under tension. By means of a small strip the thumb is also fastened in extension and abduction. After the flap is sutured in place and the wounds sutured the hand is kept bandaged for three to four weeks, the fingers of course being left free and moved every day. This operation is performed at the same time as the suture of the radial. The operation does not affect any of the important structures of the hand

so it does no harm if the nerve regenerates, and it gives the patient a useful hand if it does not.

A. Goss.

Wilms: Early Operation. Mechanics of Nerve Injuries and Technique of Suture (*Zur Frakturoperation. Mechanik der Nervenschädigung und Technik der Naht*). *Deutsche med. Wochenschr.*, 1917, xli, 1417.

Within the first ten days to two weeks after an injury it is very easy to suture the divided ends of the nerve, and if some of the nerve fibers are intact to distinguish them from the injured ones and preserve them.

The conditions are very different in late operations. A large amount of scar tissue has formed between the ends of the nerve which must be removed, and a gap is thus left which requires great tension on the nerve to fill. The limb must be fixed for a long time in the position that removes tension from the nerve. Moreover bits of bone have frequently become incorporated in the scar tissue which could have been very easily removed at early operation.

The objection is urged against early operation in all cases that it is impossible to tell whether operation is necessary or not. Wilms proposes in all cases to make an exploratory incision to find out. This can readily be done under local anesthesia, does no harm if unnecessary, and gives the patient much better chances for restoration of function if operation is necessary. The nerve fibers are generally displaced in the direction of the exit wound so that spontaneous restoration of function is impossible. To strengthen the suture it is well to leave a band of tissue from the external wall of the neuroma connecting the two ends of the severed nerve. Illustrations are given of how this is done. The sutured ends may also be enveloped in sheaths made of calves' arteries, fascia, or other material.

A. Goss.

Pitres, A.: Histological Processes in the Cicatrization and Restoration of Function of Injured Nerves (*Sur les processus histologiques qui président à la cicatrization et à la restauration fonctionnelle des nerfs traumatiques*). *J. de méd. de Bordeaux*, 1915, lxxvii, 21.

Pitres gives a detailed description of the histological processes that take place in the injury and regrowth of nerves. The nerves are made up of the nerve-fibers themselves and connective tissue. Cicatrization is absolutely different in the two kinds of tissue, it takes place very rapidly in the connective tissue, while the specific nerve tissue is restored very slowly. The connective tissue restores the physical continuity of the nerve, but not its function. Very slowly new nerve-fibers make their way through the bridge of connective tissue.

Experiments on rabbits showed that when the nerve was simply cut with a knife and reunited by first intention it took eight to eleven months to restore conductivity, when there was a distance of a

centimeter it took 13 months, and when there was a distance of 2 centimeters it took 25 to 30 months. Suppuration of course retards healing, so that it is of the greatest importance to keep wounds aseptic if possible.

Suture of the nerve within a few hours after the injury is logical and often very effective, because it prevents the ends of the nerve from being separated and exuberant connective tissue from being formed between them, and it makes it easier for new fibers to grow out from the central to the peripheral end. But however early and however perfect the suture

may be it does not prevent degeneration of the peripheral end of the nerve. The belief that the function of a severed nerve can be quickly restored in any way is a mistake. The cases that have been reported are based on mistaken observation or interpretation of facts. Late suture rarely gives good results, for it interferes with the restorative process that is going on in the central end of the nerve. Resection of the central end is contra-indicated, because it destroys the histological proliferation of nerve-tissue that has already taken place there.

A. GOSS.

SURGERY OF THE SKIN, FASCIA, AND APPENDAGES

Bowen, J. T.: Precancerous Dermatoses; the Sixth Case of a Type Recently Described. *J. Cutan. Dis.*, 1915, xxxiii, 787.

The author reports in detail 6 cases of a chronic dermatosis, 3 of his own and 3 described by Darier, which constitute a cutaneous disturbance previously unrecognized. The affection is of a chronic nature and begins as a papule covered by a horny layer and a serous exudation, forming a cornified crust, under which is found a red, oozing, granular surface. Histologically, the lesions show marked proliferation of the rete Malpighii, numerous evidences of karyokinetic division and amitoses, with clumping of nuclei and vacuolization of the cells. In advanced lesions there is hyperkeratosis and parakeratosis of the horny layer.

At the time that 2 of these cases were reported in an earlier article it was stated that they evidently belonged in the class of precancerous dermatoses, resembling histologically Paget's disease of the nipple. In 2 of Darier's 3 cases cancerous degeneration had occurred.

In 1900 Darier proposed the name "dyskeratose" for a lesion of the epidermis in which a certain number of Malpighian cells become differentiated from

the rest and undergo evolution, with the production of an imperfect keratinization. This condition of dyskeratosis is found in a group of affections which include: (1) *psorosperma folliculaire végétante*; (2) Paget's disease of the nipple; (3) *molluscum contagiosum*; (4) the precancerous dermatoses of Bowen.

Though the nature, cause, and etiological significance of "dyskeratose" are unknown, yet it is a distinctive histological lesion, the chief interest of which lies in the fact that it occurs in the cellular lesions of certain cancers. The dyskeratotic dermatoses are also clinically associated with cancer, though psorospermiosis and *molluscum contagiosum* cause epithelial proliferation without malignant sequel. The other two affections (*la maladie de Paget et la dyskeratose de Bowen*) are frankly precancerous, and while dissimilar clinically, they are alike in presenting vacuolization, confusion, and inequality of the Malpighian cells. While dyskeratosis is common to all the conditions just described, it is the degree to which it is present that is important, as the condition occurs to some extent in arsenical keratosis, *keratosis senilis*, Roentgen-ray dermatitis, *xeroderma pigmentosum*, and spinocellular epitheliomata.

E. K. ARMSTRONG.

MISCELLANEOUS

CLINICAL ENTITIES — TUMORS, ULCERS, ABSCESES, ETC.

Lathrop, A. R. C., and Loeb, L.: Further Investigations on the Origin of Tumors in Mice: Tumor Incidence and Tumor Age in Hybrids. *J. Exp. Med.*, 1915, xxii, 713.

The authors here report the results that they obtained in crossing the strains described in their preceding paper. They used some of the hybrids thus obtained for further hybridization. Soon after the beginning of their studies of heredity in cancer in mice they began experiments in hybridization in order to determine whether a tendency to a high or a low tumor rate prevailed in the offspring of

two parents, one of which had a high, while the other had a low tumor rate; or, to state it differently, whether a tendency to develop cancer is a dominant or a recessive character.

They found that in crossing strains known to differ in their tumor rates, the hybrids showed in a considerable number of cases a tumor rate corresponding to the parent with a high tumor incidence; in some cases the offspring had the tumor rate of the parent with a low tumor incidence; in certain cases the tumor rate of the offspring was intermediate between those of the parents.

That these results were not accidental was shown by the fact that they were able to show in some cases that two sisters crossed with the same strains or

with the same male gave similar offspring, and in other cases that the same individual crossed successively with two strains that behaved similarly produced hybrids with a similar tumor incidence.

The authors state that some evidence exists for the conclusion that different strains in being crossed with other strains differ in their power to impress their tumor rate upon the crosses. Thus the English strain and the first and second daughters of No. 10 have the tendency to transmit to the offspring a high tumor rate, while Cream, Silver, and some European strains other than 151 have a tendency, they state, to transmit a low tumor rate. While crosses of these daughters of No. 10 with European 151 or with No. 83 $\frac{1}{2}$ showed the high tumor rate of the mothers, the crosses of one of the same females with Cream or Silver showed an intermediate tumor rate.

The authors found further evidence for their conclusion previously stated that age class of the tumors and tumor rate were not dependent on the same factor. The age class entered into the crosses as a factor independent of the tumor rate. Thus they found in the crosses between the first daughter of No. 10 and Cream, and in the crosses between the same female and English Silver, a similar tumor rate, but the age classes differed in conformity with the difference in the age classes of the parents.

They found, furthermore, that while in some cases a tumor rate and an age class that corresponded to each other (high tumor rate, early tumors—low tumor rate, late tumors) were transmitted to the offspring, in other cases tumor rate and age class transmitted to the crosses diverged. It seemed to them that certain strains with very late tumors if mated with strains with earlier tumors had a tendency to transmit to the offspring their own tendency to very late tumors. With a certain strain lateness of the tumors seemed to be dominant, while a low tumor rate was not necessarily dominant in the same crosses. This, they state, was noticeable in the crosses into which the strain European + 102 or 103 entered as one of the parents.

If both parents had a similar tumor rate, the offspring had usually a similar tumor rate. There was, however, one exception to this rule in the case of the German-Carter mice, in which the offspring showed a much lower tumor rate and higher age class than either of the parent strains.

GEORGE E. BEILBY.

Woglom, W. H.: Diet and Tumor Growth. *J. Exp. Med.*, 1915, 105, 795.

This study by Woglom was undertaken in order to control the findings of Van Alstyne and Beebe, who found that the transplantable neoplasm known as the Buffalo rat sarcoma grew better when the hosts were fed on a diet containing carbohydrates, especially lactose, than when they were kept on a non-carbohydrate regimen, provided that these substances were administered continuously for several weeks before inoculation. The enhanced suitability

of the lactose-fed animals was sometimes shown both by increased inoculation percentage and more vigorous proliferation of the tumors, at other times by rapid growth alone, the percentage in the latter case being similar to that obtaining for the controls. If these findings were applicable to all propagable neoplasms, according to Van Alstyne and Beebe, it might be possible to rescue a poorly growing tumor, or to obtain large amounts of tissue for experimental purposes; it is evident, also, that the labor and expense incidental to adapting spontaneous new-growths for transplantation could be materially curtailed by the simple expedient of keeping on hand a number of lactose-fed animals, a possibility which demands the fullest investigation.

In summing up his experiments Woglom states that in a total of 9 experiments comprising 123 lactose-fed animals and 100 controls, the tumors were slightly larger or the inoculation percentage a trifle higher in the lactose-fed mice in three, in the control mice in three, and in three no difference could be discerned between the two groups. Such an even distribution, the author states, makes it almost certain that the addition of lactose to the diet did not in the slightest affect the growth of the tumors employed, and intimates, though of course it does not prove, that the findings published by Van Alstyne and Beebe may have been the outcome of chance.

GEORGE E. BEILBY.

Fraenkel, S., and Fuerer, E.: Experimental Treatment of Malignant Neoplasms (*Klinische Studien zur experimentellen Therapie maligner Neoplasmen*). *Wien. klin. Wochenschr.*, 1915, xxviii, 1433.

The authors describe their experiments in treating malignant tumors with the fluid expressed from tumors of the same kind under a pressure of 450 atmospheres. The treatment was attempted in two ways: the fluid was either injected directly into the animal to be treated, or it was injected into another animal, whose serum was then injected into the animal to be treated. The results of their experiments were negative, from which they conclude that tumor fluid has neither a therapeutic nor an immunizing effect. Their results are not in accord with those of Abderhalden, who has reported successful results from the use of such tumor fluid.

A. Goss.

Teutschlaender, O.: Late Tetanus (Spättetanus). *Deutsche med. Wochenschr.*, 1915, 41, 1495.

Teutschlaender describes a case of grenade injury of the thorax in which the fragment remained lodged in the muscles of the back. The patient was given a prophylactic injection of antitoxin. He had pyopneumothorax for which rib resection was done and he seemed to be recovering, when suddenly he developed tetanus and died within twenty-four hours. Mice were inoculated with material from around the foreign body and died of tetanus, show-

ing that the germs had been harbored there, and not in the empyema. The outbreak of tetanus was five months after the original wound.

Tetanus blauder accounts for this late outbreak of tetanus by the fact that the preventive inoculation held the tetanus in check for about two weeks; then, besides, the wound was an open one for a considerable time and therefore unfavorable to the development of tetanus; but the foreign body became encapsulated and in the closed wound the bacteria had an opportunity to develop. Suddenly the capsule around the foreign body, which lay near the spinal column was broken, and the active toxin was discharged into the spinal canal. Hence the extremely acute course of the disease after its outbreak.

The case cited shows that tetanus bacilli may remain encapsulated and inactive for a long time, and that the mere preventive inoculation of antitoxin does not protect the patient from a later outbreak of the disease. Fragments of shells and granulosa should be removed thoroughly; if they become encapsulated they should be removed together with the scar tissue. So long as there is any reason to suspect that tetanus bacilli may still be harbored in the body a protective injection of antitoxin should be given whenever there is a suspicious rise of temperature.

A. Goss.

SERA, VACCINES, AND FERMENTS

Balcerek, A.: Clinical Value of the Meistagmin Reaction (Beiträge zur Beurteilung der klinischen Verwerthbarkeit der Meistagminreaktion). *Med. Abh.*, Berl., 1915, xi, 1159.

Balcerek reports the results of his application of the meistagmin reaction in 46 cases of malignant tumor, 43 of them carcinoma and 3 sarcoma, and also in 135 cases of various other diseases. The details of the results are given in tables and also the histories of a number of the cases.

In most of the cancer cases the reaction was positive, and in some of them it served to confirm a doubtful diagnosis and decide the method of treatment. It was negative in a few cases of scirrhus cancer. The reaction appears throughout the malignant disease, but is more marked in the later stages. It is also positive during pregnancy, at the height of the menstrual period, and in nephritis and uræmia. In one case of cancer complicated with pneumonia the reaction was negative, but became positive after recovery from the pneumonia. Except in these conditions a positive reaction indicates cancer.

The sera used must be absolutely free from hæmolysis and perfectly clear. They should not be obtained during the process of digestion. Exudates and transudates that appear during a malignant disease may be negative even when the serum is positive, so they should not be used for the reaction.

A. Goss.

Hirschfelder, J. O.: Complement-Fixation in Diagnosis with Bacterial Extracts Prepared with Digestive Ferments. *J. Am. M. Ass.*, 1915, lxxv, 2073.

The author prepares an antigen from various organisms by allowing them to digest for a short time (variable in the case of different organisms) with trypsin or pepsin. The digested mixture is filtered through a Berkefeld or Pasteur filter and the clear filtrate used as an antigen. The gonococcus, pneumococcus, staphylococcus, streptococcus, streptococcus rheumaticus, and tubercle bacillus were used. In standardizing the bacterial emulsions for digestion a photometric apparatus was used and the unknown suspensions standardized against emulsions containing a known amount of bacteria by weight.

Tables show that antigen prepared in this way is superior to antigen prepared by other methods. Good results are reported in gonorrhœa, pneumonia, typhoid fever, tuberculosis, and streptococcal infections. The paper is in the nature of a preliminary report. More work is being done with various organisms, especially the spirochæta pallida.

F. H. FALLS.

BLOOD

Woltmann, H.: Transfusion by the Citrate Method in a Sixty-Hour-Old Baby with Melena Neonatorum. *J. Am. M. Ass.*, 1915, lxxv, 2163.

A baby girl, weighing 8 pounds, was delivered with low forceps because of an incompletely rotated head. The delivery was made without difficulty and with no apparent injury to the child. During the first fifty hours, the child was irritable and cried. She then passed a small amount of bright blood from the bowels and three hours later a larger amount of dark blood, at which time she was given a subcutaneous injection of normal horse serum. During the next seven hours eight or ten stools were passed, composed exclusively of dark blood. The ears were colorless, lips and finger nails cyanotic, and the child was having difficulty in breathing. The median basilic vein of the baby was raised through a small incision and 60 ccm. of citrated blood injected with a record syringe and needle. The child's color was noticeably improved in both the ears and the lips, respirations were easy, and for the next two hours she slept. During the next few hours two more stools of dark blood were passed, evidently that remaining in the bowel at the time of transfusion. From that time recovery was uneventful. The blood used in transfusing was prepared by placing in a sterile container 10 ccm. of sterile 2 per cent sodium citrate solution and adding to that 100 ccm. of blood removed from a vein in the father's arm with a syringe and needle.

EDWARD L. CORSELL.

Lewisohn, R.: The Citrate Method of Blood Transfusion in Children. *Am. J. M. Sc.*, 1915, cl, 586.

Among the 30 cases of blood transfusion in which the citrate method was used, 7 were in children.

The first child in whom the new method was applied was a boy, aged five years, with extensive burns. He received two transfusions of 150 ccm. of blood. His hemoglobin was raised from 42 to 72 per cent. The improvement in the general condition of the child was most remarkable.

The second case was a child, aged three years, with hemorrhages from the intestinal tract. This child received its first transfusion (Lindeman's method) in August, 1914. The hemorrhages then ceased for six months, but the patient was readmitted to the hospital in February, 1915, on account of the recurrence of hemorrhages. A second transfusion of 200 ccm. of blood (citrate method) from the father of the child failed to stop the hemorrhages. An exploratory laparotomy was then decided upon, preceded by another transfusion of 450 ccm. of citrated blood. An exploration of the stomach and duodenum was negative. Two weeks later the hemorrhages began again, and as the child was very anemic another transfusion was advised; this time the Unger method was used. The improvement following this transfusion was only temporary and a fifth transfusion (citrate method) was given in May, 1915. Since then the child has improved wonderfully. The hemorrhages have stopped entirely. The child appears to be in perfect health, but palpation of the abdomen reveals an enlarged spleen. This probably explains the hemorrhages from the stomach. This case shows how much can be accomplished by repeated blood transfusions. In regard to the new method, it shows that citrated blood is as efficient as unmixed blood. The reason that the clinical result of the last transfusion was so much better than that of the three previous transfusions (two done with the citrate method and one with the Unger method) is probably based on the fact that the blood of the last donor was exceptionally well adapted to this child's blood. Very little is known about the relative values of the blood of different donors, but it certainly is advisable in cases where one transfusion fails to give good results to try another donor.

The third case was a child, aged six months, suffering from an aplastic anemia. The child received two transfusions, each of 100 ccm. The baby had improved remarkably and showed an excellent color, but it was readmitted to the hospital two weeks later on account of severe gastroenteritis, to which it succumbed on August 15, 1915. In tiny infants, a small amount of blood ought to be introduced repeatedly in order to safeguard against sudden overloading of the circulatory system.

The fourth case was a nine-months-old baby, the indication for transfusion was a severe anemia. The child received 100 ccm. of blood and the hemoglobin was raised from 16 to 24 per cent. The child's condition was decidedly improved. This was the only case in this series which had quite a severe reaction (rise of temperature to 102° F. with-out chill) following the transfusion.

The fifth case, a seven-year-old girl, had profuse

intestinal hemorrhages on the fourteenth day of typhoid fever. The hemorrhages were so profuse that the child was in a dying condition; she was unconscious and the radial pulse was not palpable. An immediate transfusion was done, the blood being taken from the mother; in all 400 ccm. of blood was transfused. The change in the condition of the child was most remarkable. She reacted while she was receiving the blood and the pulse appeared. The hemorrhages stopped and no further bleeding occurred during the course of the illness. The disease ran a very severe course, and to combat the marked sepsis a second transfusion was deemed advisable. This was again done by the citrate method three weeks after the first transfusion. The symptoms of severe typhosepsis were not changed by this transfusion and the child died seven weeks after the onset of her illness.

The sixth case was a three-year-old boy, a hemophilic, who was very much exsanguinated from a severe hemorrhage which had lasted for twenty-four hours. He received 250 ccm. of citrated blood and the bleeding stopped immediately; his hemoglobin was raised from 19 to 39 per cent.

The last case, the youngest in this series, was a baby, aged twenty days, which had been bleeding since its birth from the umbilicus. The transfusion of 80 ccm. of citrated blood stopped the hemorrhages immediately and permanently; the baby was taken home a few days later.

EDWARD L. CORNELL.

BLOOD AND LYMPH VESSELS

Clinton, M.: Traumatic Aneurism of the External Iliac Artery. *Am. J. Surg.*, 1915, XXX, 454.

Clinton reports a rare and interesting case of aneurism of the external iliac artery occasioned in a patient by an injury sustained while jumping on a moving car. He became lame after the injury and about six weeks later a lump appeared under the tender area. The lump was tender and caused a "beating pain." The lump and lameness increased, and at the time of the operation the aneurism was found to be about the size of a bantam egg, and of a sacular type. The sac was obliterated with mattress sutures and this was reinforced by a silk ligature gently tied in the place of the upper clamp. The patient made a very good recovery.

E. C. ROBERTSON.

Oser, E.: Aneurism and Its Treatment (Ueber Gefassaneurysmen und deren Therapie). *Wien. klin. Wochenschr.*, 1915, LVIII, 1596.

Operation is the only method of treatment. Injection of coagulating substances into the sac involves great danger of embolism. Compression only prevents increase in size, but does not cure. The author demonstrated a case in which compression had been applied to an aneurism of the subclavian for six months because the patient refused operation; there was practically no decrease in size.

Immediate operation is indicated in threatened

perforation and infection. When perforation threatens, the pressure inside the sac becomes very great and this causes intense pain from pressure of the nerves and stretching of the sac.

Among 28 cases of aneurism that the author has had since the beginning of the war, emergency operation to prevent perforation had to be performed in 4; in one case an aneurism of the subclavian perforated, but the life of the patient was saved by immediate ligation of the vessel.

The author demonstrated a case of very large aneurism of the subclavian that was operated on just in time to prevent rupture. In the infra-clavicular fossa there was a tumor as large as a child's head; the scapula was pushed out on that side. After temporary resection of the clavicle and ligation of the proximal and distal ends of the vessel the sac was opened and drained posteriorly and anteriorly. Uneventful recovery followed. Suture would have been impossible in this case.

During the Bulgarian War the consensus of opinion among surgeons was that the best treatment was ligation of the affected vessels and extirpation or drainage of the sac. Since the beginning of this war most surgeons have advocated suture of the vessels, but the results reported thus far have not been particularly brilliant. The technique of suture is not so difficult but it lengthens the time of the operation and increases the danger of infection. The outcome of the operation is still more doubtful when whole pieces of vessel are transplanted. The author did not have gangrene or trophoneurotic disturbances in any of his 28 cases. One case that was very septic when the operation was performed died of sepsis. Operation on aneurism should be as early as possible, as it is easier to operate while the sac is thin, and collateral circulation is established within a few days.

In the discussion, von Eiselsberg recommended early operation and held that suture was the ideal method of operation. He has operated upon 65 cases, performing lateral or circular suture in 20 of them. Five of the 65 patients died. A. Goss.

Price, J. W.: *Blood-Vessel Anastomosis; with Especial Reference to the Use of Cannula-Forceps.* *Am. J. Surg.*, 1915, xxix, 431.

Price reviews the many attempts at blood-vessel anastomosis and tells of a cannula-forceps devised: (1) to obviate the need for stay sutures; (2) to accurately approximate endothelial surfaces of vessels to be anastomosed; (3) to prevent constriction at the suture line; (4) to alleviate the necessity of a skilled assistant in vessel surgery; and (5) to shorten the time of the procedure.

The cannula has a caliber of 1.5, 2, and 3 mm. and is slightly spooned at one extremity. It may be used for temporary anastomosis between two blood-vessels, for transfusion, or for permanent end or end-to-side anastomosis. Price's new modification consists in the addition of three barbs placed equi-

distantly around the circumference of the cannula. The technique is as follows:

1. The cannula is opened and then closed to include the vessel, 3 to 4 mm. from its cut end. The end of the vessel is then caught by three iris hooks from within and "cuffed over" the spooned portion of the cannula and held by the three barbs.

2. The end of the second vessel is then caught from within by iris hooks and pulled over the everted end of the cannula and fastened on the barbs, thus bringing the endothelial surface of one vessel next to the endothelial surface of the other.

3. A continuous suture is inserted through all the coats of the blood-vessel 2 mm. from the approximated ends.

4. The vessels are removed from the barbs.

5. The cannula is slipped out of the cuff away from the line of sutures, and is then opened and removed.

6. The Crile clamp distal to the anastomosis is removed first, then the proximal clamp, allowing the blood to flow. Other sutures are inserted to control oozing.

H. G. GARWOOD.

SURGICAL THERAPEUTICS

Symmers, W. St. C., and Kirk, T. S.: *Urea as a Bactericide; Its Application in the Treatment of Wounds.* *Med. Press & Circ.*, 1915, c, 512.

The action of urea is demonstrated by the following experiment: Old putrid tuberculous sputum gave, on ordinary agar tubes, a confluent mass of growth of various bacteria; this sputum was then saturated with urea at room temperature and, after fifteen minutes, a loopful was smeared on agar tubes, the result being that only three colonies developed. When the ureated sputum was planted out after thirty minutes only one colony appeared on the agar tube, thus contrasting markedly with the control tube, which, as stated, was covered by a confluent mass of growth in which the colonies were too numerous to be counted.

This bactericidal effect is active in the presence of blood and such like organic fluids. Moreover, urea is non-irritating to living tissues and the dry substance may be sprinkled over wounds to almost any extent without any injury to the parts resulting.

Of the several cases quoted, the following is abstracted:

A soldier was admitted to the hospital with a large crepitating abscess over the sacrum. The abscess was opened, and three pieces of metal were removed and a quantity of gas containing pus was liberated. The cavity was scraped and solid urea was put into it and the skin closed with a continuous silkworm gut suture without drainage. Union by first intention took place. The pus was planted out on agar and a gas-producing micro-organism grew copiously.

Since October 4, 1915, all the wounded soldiers have been treated with urea and it has been found that sloughing infected wounds dressed with urea

once in twenty-four hours give better results than similar cases treated in any other way.

The striking fact noted in watching wounds treated with urea under protective tissue is the absence of the venous congestion of the tissues that occurs in cases treated with ordinary wet dressings, continuous irrigation, or frequent baths. The circulation in the tissues is normal and repair seems to be much more rapid than under the conditions produced by fomentations, etc. Likewise, there is no irritation of the skin.

The drawbacks to its use are that in some cases it produces a considerable amount of pain, which can be met by the administration of morphia, and in the fact that urea absorbs moisture somewhat quickly and becomes caked. This caking, however, can be prevented by exposing the urea as little as possible to the air.

EDWARD L. CORNELL.

Grangée: Heliotherapy of War Injuries (*Heliothérapie des blessures de guerre*). *Paris med.*, 1915, v, 135.

Grangée has charge of a military hospital of 150 beds, and has established an improvised service for heliotherapy in a neighboring vacant lot. The patients are simply placed on mattresses laid on the ground with their heads protected by umbrellas. He has treated in this way three classes of cases: (1) fractures, (2) fistulae, (3) torpid wounds showing no tendency to cicatrization. He has had much better results in his treatment than before he began to use heliotherapy. The scars are less adherent, more supple, and never painful. The callus is never exuberant. The repair of the wound and the consolidation of the bone take place more rapidly. Sequestræ are often eliminated spontaneously. He does not expose very large wounds to the sun immediately. He tried it and found that it caused a rise of temperature and an increase of suppuration. But in two or three weeks the most severe wounds can be exposed directly to the sunlight without any covering at all.

If covered with a light dressing to protect them from the air the patients can be given heliotherapy at once. Wounds are desloughed almost at once when exposed to the sun, and the temperature falls. The suppuration increases at first and then decreases rapidly. He had only one failure in the case of a torpid wound after amputation of the foot for gangrene from freezing. The patients were at first exposed for half an hour a day, which was gradually increased to three or four hours. Sometimes there was erythema, but it was never serious and doubtless could have been avoided with care. He thinks this treatment might be applied advantageously in industrial accidents.

A. GOMA.

RADIOLOGY

Richards, A.: The Biological Explanation of X-Radiation Effects. *Am. J. Roentgenol.*, 1915, ii, 368.

Three theories are reviewed: the leucithin hypothesis of Schwartz, the chromatin hypothesis of

Hertwig; and the enzyme hypothesis of Packard. The first, the author regards as overthrown. After briefly recounting his experiments with the other two, he mentions a fourth, as follows: "During the last several years attempts have been made to explain many vital phenomena as due to changes in the permeability of cell membranes to various substances in solution; . . . If the permeability be changed for any of these substances, we may expect a difference in the activities of the cell, due to the penetration of a different set of chemical substances. The suggestion offered itself that X-radiation may act by causing such changes. To test this possibility, the author performed experiments along several different lines. . . . The conclusion seems warranted that permeability changes are not the causal factors in the events which follow radiation."

The facts as they are at present known in regard to the effects of radio-activity on living matter, show that life processes are subject to marked changes under the influence of radiation, a slight exposure being accelerative in most cases, while a more intense treatment is inhibitive or destructive. As a causal factor in these effects, the demonstrable injury to the chromatin of the cells is undoubtedly important; but there are also substantial evidences that the modifiability of enzymes under the action of the rays likewise plays a considerable part either directly or indirectly in the resulting injury.

DAVID R. BOWEN.

Murphy, J. B., and Morton, J. J.: The Effect of Roentgen Rays on the Rate of Growth of Spontaneous Tumors in Mice. *J. Exp. Med.*, 1915, xvii, 809.

The author's first problem was to determine whether or not X-rays in a small dose administered to an animal as a whole would produce an effect on the subsequent growth of a cancer, different from that produced by a similar dose applied directly to the cancer outside the body. For this purpose it was necessary in one set of animals to confine the X-ray effect to the animal alone, ruling out any possible action on the cancer, and in a second set to confine the X-ray effect to the cancer, preventing an indirect effect on the animal. Spontaneous tumors of the mouse were selected for this work as a more suitable material than the transplanted tumors. The results are given briefly as follows:

In the first series there were 53 mice with various stages and types of spontaneous cancers in the group. The tumors were removed as completely as possible by operation, and the whole animal was then exposed to a stimulating dose of X-ray (Coolidge tube). Immediately afterward a graft of the original cancer was replaced in the groin of the animal. In 26 of the 53 animals treated in this fashion, there resulted a complete immunity to the recurrence of the disease. Only those animals were included in this number that lived and remained in good physical condition for at least five weeks after

the treatment. The majority lived from two to four months, some eight months, and some are still living. There has been no evidence of a local recurrence at the site of operation, nor where the graft was implanted, nor of metastasis in those that have died. Among the remaining 26 animals of the series the average time for the appearance of the graft was five weeks and four days, a figure which contrasts strongly with the figure for the control animals. The number of recurrences at the original location of the tumor was 11 among the 52 animals, all occurring in the latter 26.

In the second series, for controls the authors had 20 mice with spontaneous tumors of various sorts. These animals were operated on in the same manner as the animals in the first series, but a graft of the cancer was returned without treatment of either the animal or the cancer. The tumors were kept outside the body for the same length of time as in the first series. In 28 of the 20 cases the grafts grew progressively. In one the graft grew for a period and then retrogressed to complete absorption. The average time for the grafts to become palpable was one week and five days. This is about the same figure obtained by Rous. Local recurrences of the cancer occurred in 14 of the 20 animals.

In the third series the cancers were removed in the same manner as in the first two series, but in this group the cancers were subjected to the same amount of treatment that the animals in the first series received. A graft from the cancer, after this treatment outside of the body, was returned to the groin of the original host, as in the other experiments. Ten mice with spontaneous tumors were used for this series, and in all 10 cases the returned grafts grew. The average time for these to become palpable was one week and three days. There was a local recurrence of the tumor in 4 of the 10 animals.

GEORGE E. BILBY.

MILITARY SURGERY

Primrose, A.: Disabilities, Including Injuries Caused by Bullets, Shrapnel, High Explosives, etc. *Canad. M. Ass. J.*, 1915, v, 853.

Of 819 cases coming before the medical board to be examined as to their fitness to return to active service after furlough on account of sickness, non-traumatic conditions were found to exist in 314 cases. Many cases of disability were accounted for by flat-foot, varicose veins, hernia, heart-disease, hemorrhoids, and tuberculosis. Men subject to these diseases should not be enlisted because they are rather a burden than a help to the army.

Of the traumatic cases, injuries of the upper part of the body were the most common. Gas poisoning was responsible for 96 cases of disability, 17 of which suffered nerve exhaustion and 36 of which had other wounds in addition. Nervous shock is important as a sequel to injury and the soldier should not be returned to action until completely recovered.

The 505 traumatic cases were divided as follows:

Traumatic effects of high explosives	39
Injuries caused by accidents, and not due to bullets, shrapnel, etc.	54
Gas-poisoning cases	96
Gunshot, bullet, and shrapnel wounds, etc.	316
Total	505

J. H. SKILES

Soubeyran: Treatment of Wounds in War (Le traitement des plaies de guerre). *Paris: méd.*, 1915, v, 482.

Soubeyran describes three stages in the treatment of war wounds:

1. The first is mechanical and consists in freely opening up and cleansing the wound, curettage, hemostasis, and drainage, but no suturing.

2. The second is the antiseptic or chemical stage. Various antiseptics may be used, but they should be used in weak enough solution so as not to injure the tissues. They should be applied soon after the wound is made to be of service, for after the bacteria have begun to proliferate deep in the tissues antiseptics do not reach them.

The third stage he designates as physiological, and he believes that nutrient fluids, such as those of Locke and Ringer, Hédou and Fleig and Schiassi, are of great service. They bring about the best conditions for the spontaneous repair of the diseased tissues.

For several months the author has been using Schiassi's fluid in cases of very severely infected wounds and has had the best of results. The formula for the solution is: sodium chloride 6.5 gm.; potassium chloride 0.3 gm.; fused calcium chloride 1 gm.; sodium bicarbonate 0.5 gm.; glucose 1.5 gm.; and distilled water 1,000 gm. The sodium and potassium contribute to the nutrition of the cells; the sodium bicarbonate combats acidosis, and the glucose is nutrient. In addition to being used to irrigate and dress wounds these solutions may be given subcutaneously or rectally by the drop method with good results.

A. Goss.

Fauntleroy, A. M.: Report on the Medicomilitary Aspects of the European War. *Bureau Med. & Surg., Navy Dept.*, Washington, 1915.

Fauntleroy contributes a valuable monograph on this now exceedingly interesting subject, the text being well illustrated by many excellent reproductions of photographs.

The reviewer cannot resist the temptation, since a detailed abstract of such a large monograph is physically impossible in the allotted space, to point out that Fauntleroy's contribution differs in two respects from the many "reports" which have been published in the American medical journals since the outbreak of the present European War. First, in that he did not endeavor to treat the entire problem of war surgery, and, second, in that he has not restricted himself to personal observations in a limited sphere, but, equipped as he was, with excellent military training, he studied certain prob-



Fig. 1. Showing great mutilating effect of grenade wound of face with loss of right eye.



Fig. 2. Shrapnel wound of face with multiple fracture of lower jaw and considerable loss of substance.



Fig. 3. Showing front view of high-explosive shell wound involving loss of lower jaw and great destruction of tissue.

lems from the standpoint of the professional military surgeon, surveying situations from an aeroplane, as it were, which afforded him a bird's-eye view of the entire battlefield from the firing line to the base hospitals.

While the object of his report is to point out the actual lessons learned from this great, if not the greatest war, and while the average civilian surgeon will be unable to apply the lessons to a possible war of our own, except under situations of topography resembling the battlefields in France where the observations were made, it will be worth while for every member of the profession interested in military surgery to read Fauntleroy's monograph, because he is the first one in American literature to have pointed out the probable activities of a professional character in base hospitals.

The author divides his report into four parts. In the first he takes up the organization and equipment of the fighting units with reference to sanitary relief. He discusses with the precision of a technician the weapons in use, their ballistics, and the wounds they produce. An interesting section is devoted to asphyxiating gases. He refers to these gases as chlorine or bromine compressed to liquid form and liberated from tanks. The gases being heavy hug the ground and sink into the trenches. Unprotected troops rapidly develop a capillary bronchitis causing death by "drowning." Those receiving concentrated gases die in a very few hours either from edema of the glottis or from heart exhaustion in attempting to pump the blood

through the engorged capillaries surrounding the bronchioles.

Prophylaxis is of the utmost importance. This is accomplished by a combined helmet and respirator (mask) which is intended not only to render the gas innocuous, but also to protect the eyes. A snugly fitted mask, held tight by means of elastic bands will be satisfactory. Detailed description of the pattern with the openings for the eyes and mouth and extra pads containing moist chemicals to neutralize the obnoxious gases is furnished.

In the second part Fauntleroy takes up the transportation and care of the sick and wounded. This forms a highly interesting chapter to American readers who must bear in mind the facilities which are conspicuous by their absence in the western part of our country.

Fauntleroy begins by complaining, as most medicomilitary writers have done after all preceding campaigns, that ammunition trains have the right of way, and after these come the provision trains. The abstracter points out that while war represents a huge traumatic epidemic, dead and wounded are losses—the latter even burdensome incumbrances—which cannot expect the attention given such wfortunates in civil life, since, when the safety of a nation is at stake, the achievement of victories is the sole aim of commanding generals, and they allow medical personnel and institutions rather because they help to maintain fighting efficiency than from any humane notion. This is a fact which few civilian medical men realize.



Fig. 4. High-explosive shell wound of right shoulder, with entire loss of deltoid muscle and complete shattering of upper half of right humerus; but the larger blood-vessels and nerves were uninjured. The wound was infected and there were numerous large sloughs in different parts of the wound. A large number of small fragments of bone were removed in this case, and under wet dressings and overhead extension the wound rapidly cleared up; the patient was comfortable and could be dressed without pain.

The task of transporting the wounded is, even at best, a complicated one, undergoing startling variations, taxing the courage and resourcefulness of military surgeons. This is due, not so much because there is not enough personnel to cope with the enormous number of wounded, but to the rapid expansion of the medical department, which prevents smooth running of the machinery — a preachment which members of our medical reserve corps, in active list, should take to heart.

A military unit may advance, retreat, or remain stationary, any one of which may create situations of the greatest difficulty for the diverse medical services. In an advance the situation for the wounded is the most favorable if there be a sufficiency of transport facilities. If the enemy ad-

vances, first-aid stations, temporary hospitals, etc., at the front must be speedily evacuated, and much confusion results as well as loss of equipment which must be eventually replenished. In stationary campaigns, such as is now extant in France, time is afforded to perfect and maintain organization.

The railway companies have reconstructed their lines to meet the demands created by the war. The organization of the diverse aid and dressing stations, field hospitals, etc., is given in great detail.

Considering the tremendous number of persons and institutions placed at the disposal of the war department, it could not be expected that all aid would be uniformly organized. In spite of the fact that in nomenclature and organization proper there is some difference between the French service



Fig. 5. Fatal case of gas-bacillus infection of the arm and forearm following a high-explosive shell wound of upper arm. Patient received five days after injury and an immediate amputation performed at the shoulder-joint.



FIG. 6. Showing a gas-bacillus infection of a mutilating shoulder wound, due to a high-explosive shell fragment, and accompanied by necrotic infiltration of a large part of the chest wall, which proved fatal. The patient was received five days after injury and the necrotic material was removed, followed by continuous irrigation.

and that of our own army medical corps, which resembles more closely the organizations of the German army, in reality they are all alike in the essential features in regard to aid stations near the firing line, ambulance companies with dressing stations as a second line of relief, field hospitals, and evacuation and base hospitals closer to the home zone.

A noteworthy variation is presented by the field hospital under the charge of Dr. Alexis Carrel, which in reality is an advanced base hospital of sixty beds. Carrel gets only the most serious cases. There experiments are made with antiseptics to combat the infection of wounds. Dr. Dakin has compounded a solution of sodium hypochlorite which seems to meet all demands, so that the wounded can be early transported to hospitals to the rear and new ones accepted to keep the sixty beds filled all the time.

Of special interest are the transportable hospitals which make possible the employment of first class surgery where no suitable building is available.

Coming to the base hospital work, Fauntleroy makes a statement which is characteristic, in the light of the introductory remarks given above. "By far the largest percentage of cases treated in base hospitals are compound fractures involving long bones and mutilating wounds of the face. He goes on to state what is already known to military surgeons, that at the frontal institutions such cases which would never reach the base hospital alive, must be taken care of, and at the base such cases which present less acute complications of

serious wounds will be the ones coming for surgical aid. Thus a hemorrhage from vessels in the abdomen will be seen only at the front. But abscesses and fecal fistula will be the clinical material at the base hospitals. It is evident, therefore, that here doors are thrown wide open to the specialist surgeon for operative work of a reparative and corrective character for oral, facial, and other prosthesis, and for a decided struggle against sepsis. It is in these hospitals that individualization comes into its own and that the higher war surgical problems can be solved satisfactorily and the skill of higher surgery brought into play, drainage, splinting, and all sorts of extension, irrigation of wounds, etc. This is a picture of daily routine on newly arrived patients at the American hospitals at Neuilly, under Dr. Blake, described by the author, and typical of all other hospitals.

Fauntleroy contributes an exhaustive discussion on gas bacillus infection, but outside of conveying detailed information on this terrible result of modern warfare, illustrated by highly instructive photographs, adds little to what is already known of the character and treatment from contemporaneous literature.

Special contributions on neurologic, pathologic, and dental work are interesting but offer nothing especially new to the military surgeon. It must not be forgotten that the volume under consideration is not intended as a manual on war surgery, but is merely a report by a military man to his department chief. Unfortunately naval surgeons and surgeons to the land forces have experiences not always



Fig. 7. Showing Dr. Edmund B. Piper's system of hydraulic irrigation.

identical. Under these conditions the work represents an effort highly creditable to the author and must be looked upon as a valuable and authentic contribution to military surgery.

GUSTAVUS M. BEECH.

Leslie, R. M.: Clinical Effects of Asphyxiating War Gases. *Am. Med.*, 1915, 3, 875.

The gases used in the European War consist mainly of chlorine and occasionally bromine. The gas is projected from cylinder tubes, and, being heavier than air, it floats along the ground.

The main effect of the gas is to produce an acute irritation of the respiratory mucous membrane which may be fatal at once or may result in later complications. The complications which arise are edema of the lungs, acute laryngitis and bronchitis, bronchopneumonia, gangrene of the lung, or distant lesions resulting from changes in the blood. Gangrene of the feet has resulted. Kidney irritation is common, and disorders of the nervous system result frequently.

The symptoms are primarily referable to the respiratory tract. Choking, cyanosis, and frothing at the mouth are accompanied by vomiting. Severe shock and collapse ensues. Food is refused on account of the nausea. In a few days symptoms

of pneumonia may develop. Many cases are so disturbed nervously that they are unfit for military duty for many months.

The treatment is either prophylactic or curative. The prophylactic is the most important and consists of the wearing of a proper respirator soaked with some alkali, such as sodium carbonate solution. Sir Hiram Maxim has devised an apparatus for lighting bombs in the vicinity of the gas cloud in order to cause an upward air current and so take the gases upward.

The curative treatment is mainly the accepted one in regard to lesions of the respiratory tract.

J. H. SKILES.

Ferraton: Military Surgery at the Front with the Fourteenth Army Corps (La chirurgie de guerre de première ligne au xiv corps d'armée). *Lyon chir.*, 1915, 30, 595.

Ferraton describes the transportation of the wounded from the trenches to the surgical hospital near the firing line. Stretcher-bearers are stationed in the trenches with the soldiers and are exposed to the same dangers. Many of the trenches are so narrow that ordinary stretchers cannot be used, and chairs or hammocks suspended on poles have to be substituted. Even in the trenches there are first-

and stations — little subterranean rooms capable of sheltering one or two wounded men, and protected from the shells as well as possible. Here there is a physician stationed who can give injections of ether or camphorated oil, or morphine for allaying pain and to control threatening hemorrhages.

Most of the wounded are carried to the dressing station of the regiment, established in a farmhouse or schoolhouse or even in the cellars under demolished houses. These stations are exposed to the fire of the enemy too and the equipment is sometimes quite rudimentary. The wounds are examined, painted with iodine, aseptic dressings applied, and fractures hastily immobilized, but no operations are performed, except occasionally ligation for hemorrhage or tracheotomy for threatened asphyxia. From this point the division stretcher-bearers, under the command of a medical officer of the first rank, carry the wounded to the sorting ambulance. They are transported on stretchers and in two and four-wheeled carriages drawn by horses.

There are three sorting ambulances belonging to the fourteenth corps. Here, too, only emergency operations are performed; tetanus antitoxin given, and fractures more carefully immobilized. The wounded are divided into three classes: (1) those only slightly wounded who need nothing more than the simple treatment given here; (2) the moderately wounded who require surgical attention; and (3) the severely wounded, for whom immediate operation is important. The moderately wounded are sent to the evacuation hospital and the severely wounded to the surgical hospitals, three of which are attached to the fourteenth corps. The author's work has been in one of these. Automobiles travel night and morning from the sorting ambulances to the surgical hospital; telephone communications make it possible for automobiles to be sent at any time for emergency cases. A difference of a very few hours sometimes decides the life of the patient. Automobiles are sometimes sent directly to the dressing station for severe cases to save the time necessary for going through the sorting ambulance.

All kinds of operations are performed at these hospitals, within from two to five or six hours after the men are wounded. Some surgeons have held that it would be better to forward the patients to the nearest city with a well-equipped hospital before performing the more serious operations, but the author thinks that the decrease in time and the avoidance of shock from transportation more than compensate for any defects in the equipment of these hospitals, and that they save many lives. They have treated 1,541 wounds, 254 of them being of the lower limb, 284 of the head, 273 of the arm, 97 of the thorax, 49 of the abdomen, 26 of the neck, and 18 of the pelvis and lumbar region. The chief difference between the wounds of this and those of previous wars is the great preponderance in this war of shell and shrapnel wounds and the greater amount of infection on account of the size of the wounds and the conditions in the trenches. Small

wounds from ordinary bullets, which are greatly in the minority, may be regarded as non-infected and are simply cleaned, painted with iodine, and an aseptic dressing applied; but large and medium-sized wounds should be thoroughly opened up, cleansed, irrigated, all bone fragments, necrotic tissue, and foreign bodies removed and drained. It is particularly important to open up medium-sized wounds, with an opening say the size of the finger, otherwise the external wound may close up and shut in bacteria which will proliferate rapidly in the deep tissues. If there is any doubt as to a fracture, the treatment for fracture should be given till a radiograph can be made. No manipulations should be resorted to that would cause displacement of the ends or of loose fragments. Loose fragments should be removed, but fragments that are attached by periosteum, even if they are movable, should be left alone. For the dressing of fractures solid plaster casts are too heavy and do not allow of perfect care of the wound. Partial plaster casts united and solidified by rings of metal are preferable. To secure extension they may be provided with curtain rods that glide in and out, or with rods with springs interposed.

The kind of disinfectants used in wounds is not so important as the care and attention with which they are applied. The author prefers irrigation with potassium permanganate followed by hydrogen peroxide. Gauze moistened with alcohol or ether is the best dressing. The dressing should be left on several days unless there are signs of infection, when the wound should be opened up and irrigated frequently.

In joint lesions Ferraton practices early arthrotomy; if this is not effective resection facilitates drainage. Conservative treatment is the rule in injuries of the thorax unless it is necessary to control severe hemorrhage. If a pleural effusion becomes infected, pleurotomy is indicated. All wounds of the skull should be trephined, disinfected, and drained. The brain should not be explored for deep projectiles. Operation should be performed in injuries of the abdomen to control intra-abdominal hemorrhage. In other cases expectant treatment is favored.

A. Goss.

SURGICAL DIAGNOSIS

Wilcox, H. B.: MacEwen's Sign. *Arch. Pediatrics*, 1915, XXIII, 909.

The diagnostic value of the sign has been questioned by some, perhaps largely because as yet there has been no definite attempt made to classify skull percussion with reference to the size, density of the skull, stage of development of the bones, age of the individual, and influence of disease upon these factors. In order to conclude anything from such percussion, there must first be established a normal note for the various sorts of skulls that come under observation, as is recognized in the percussion of

the chest in the infant or adult with thin or thick walls.

Macewen's sign is best determined by the stethoscope placed on the forehead just above the base of the nose. The skull is tapped directly with the percussing finger or hammer over the parietal region, beginning just over the parietal boss, from which the percussing finger should approach the point at which the stethoscope is applied. This should be carried out on both sides of the head.

The typical sign, observed in this way, consists of a high-pitched, sharp, short, cracked-pot note. It is most distinct when percussion is being done over, behind, or below the parietal boss on either side, is unchanged as the point percussed passes downward, and diminishes in intensity and character as the percussing finger approaches the stethoscope. The latter point is important and is valuable in differentiating between a false and true Macewen sign, as the reverse obtains in percussing the normal skull; that is, the nearer to the point of listening the tapping is done, the more loudly the note is heard.

After a thorough discussion of the sign as seen in diseased children of varying ages, the author concludes as follows:

1. The skulls of children of various ages and development have percussion notes peculiar to the state of the cranium.
2. It is possible to establish a note normal to the various types of crania found in infants and children.
3. A positive Macewen sign exists when variation from the normal note is found. It consists in a relative change rather than a definite condition common to all diseased crania.
4. The sign is better elicited by the stethoscope than by the unaided ear.
5. Increased clearness of sound when percussion is done over the posterior portion of the skull rather than near the stethoscope is diagnostic.
6. The sign uniformly accompanies conditions of increased intracranial tension and is not found unless this causative factor exists.
7. It is equally applicable to infants and older children.
8. It was present in 50 of 53 cases of tuberculous meningitis.
9. It was present in 17 of 18 cases of meningitis of other types.
10. It was present in all of 5 cases of poliomyelitis.
11. It was found to vary directly with the development and recession of cerebral symptoms as complications of disease not directly affecting the central nervous system.
12. It was present in 11 of 13 cases of pneumonia, in 5 of which lumbar puncture showed increased cerebrospinal fluid under pressure.
13. The sign is uniformly lacking in children normal as to the brain and its coverings.

EDWARD L. CORNELL.

MEDICOLEGAL

Operation on a Minor Without Consent of Parent.

Bakker v. Welsh et al. (144 Michigan, 630.)

This was a suit brought by the administrator of the estate of Stephen Bakker, deceased, against Drs. Welsh and Apted for the death of Bakker from the alleged causes of operation without consent and also for the alleged careless and negligent use of the anæsthetic. The trial court directed a verdict for the defendants and the plaintiffs appealed.

The evidence in the case, as disclosed by the record, is as follows: Stephen Bakker, a farmer's son about seventeen years of age and apparently healthy, had a tumor on his left ear which had disappeared but reappeared and in February, 1904, he went to Grand Rapids, Mich., and in company with three adult relatives consulted Doctor Welsh, who after an examination told him that he deemed a microscopic examination necessary and sent the boy to a specialist who took a specimen of the tumor. The boy returned to the doctor less than a week later with an adult relative and was told by Doctor Welsh that the best thing to do was to have the tumor removed by a surgical operation at the hospital. There was some conversation at this time about the danger of taking an anæsthetic and the boy and the adult relative were told that there was always some danger connected with any operation. The following Tuesday the boy went to the hospital, accompanied by an aunt and an adult sister, where Doctor Welsh had made arrangements with Doctor Apted, to administer the anæsthetic. A careful examination of the patient's heart and lungs was made at the time by Doctor Apted and they were found to be normal. The boy was then placed upon the operating table and Doctor Apted started the anæsthetic, using the mask and drop method. He had used about one-third of an ounce and Doctor Welsh had just begun the operation when suddenly the patient's heart stopped beating. Every means known to the profession was used in an effort to revive the boy, but he was already dead.

Suit was brought on two charges: first, that the operation was performed without the consent of the boy's father and, second, that the anæsthetic was carelessly and negligently given. In regard to the first contention of the plaintiff the Court, after briefly reviewing the testimony on this phase, said, in substance, that there was nothing in the record to indicate to the attending surgeon, before entering upon the operation, that the father of the boy did not approve of his son's going to the doctor with his aunt and two adult sisters and following his advice and stated that it would be too harsh a rule to say that the defendants should be held liable because they did not obtain the consent of the father before the administration of the anæsthetic. The question of the alleged malpractice was disposed of by the Court, briefly, by the statement that the record instead of disclosing want of skill or care in the operation showed quite the contrary. The directed

verdict of the trial court in favor of the defendants was affirmed.

J. A. CARTAGNINO.

Operation on a Wife Without Consent of Husband.
Pratt vs. Davis. (124 Illinois, 1901.)

This case like the one previously cited deals with the question of operation without consent, but the finding of the court in this case was against the doctor.

In this case Mrs. Davis, the plaintiff, brought suit against Doctor Pratt for removal of her ovaries without consent. The facts, as shown by the record, are briefly as follows: The plaintiff came to Doctor Pratt for treatment for epilepsy in May, 1896. She had been subject to epileptic seizures for a period of about fifteen years, but had been able to perform her household work and had also borne four children. The seizures had gradually increased in frequency and following each one she would be weak in body and uncertain in mind for a number of hours. Doctor Pratt made an examination of her in May, 1896, and found her uterus contracted and lacerated and her rectum diseased. He operated for these difficulties May 11, 1896. She remained at the hospital for several weeks without improvement and then returned home. On July 29, of the same year, her brother-in-law, at the request of her husband, took her to the hospital, and on the next day Doctor Pratt operated and removed her ovaries and uterus. She remained at the hospital until August 8 and was then taken home. Neither operation was successful so far as improving her health was concerned and August 23, she was taken to the insane asylum at Kankakee. She was not a witness.

The suit was brought against Doctor Pratt based upon the second operation for the removal of the ovaries and uterus, alleging that it was performed without consent. There was no allegation that the operation was carelessly or negligently performed.

The defendant relied on certain conversations which he testified had taken place between himself and the plaintiff's husband just prior to the first

operation and also after the plaintiff had returned home after the first operation. The substance of these conversations, according to the testimony of Doctor Pratt, was that Mr. Davis said that he was willing that Doctor Pratt should do anything that he thought was necessary and that Doctor Pratt told Mr. Davis that two operations might be necessary. Doctor Pratt also testified that after the patient had gone home that "Mr. Davis told him that his wife was no better. Doctor Pratt told him to bring her back for the finishing work, but did not tell him what the finishing work would be. Doctor Pratt had but one comprehensive talk with the husband; that was the time he was at the doctor's office with the plaintiff. These two conversations were relied upon by the defendant as authority for the performance of the operation in question.

The Court held that the foregoing conversations were not sufficient authority for the performance of any operation of the character of the one performed. The concluding paragraph of the opinion of the Court we believe to be of sufficient import to warrant its quotation. It follows:

"Where the patient desires or consents that an operation be performed and unexpected conditions develop or are discovered in the course of the operation, it is the duty of the surgeon, in dealing with these conditions, to act on his own discretion, making the highest use of his skill and ability to meet the exigencies which confront him, and in the nature of things he must frequently do this without consultation or conference with anyone, except, perhaps, other members of his profession who are assisting him. Emergencies arise, and when a surgeon is called it is sometimes found that some action must be taken immediately for the preservation of the life or health of the patient, and it is impracticable to obtain the consent of the ailing or of anyone authorized to speak for him. In such an event the surgeon may lawfully, and it is his duty to, perform such operation as good surgery demands, without such consent. The case before us, however, does not fall within either of these two classes."

J. A. CARTAGNINO.

GYNECOLOGY

UTERUS

Baisch, K.: Results of Mesothorium Treatment in One Hundred Cases of Cancer of the Uterus (*Erfolge der Mesothoriumbehandlung bei 100 Uteruskarzinomen*). *München. med. Wchnschr.*, 1915, lxx, 1670.

Since February, 1914, Baisch has treated all his cases of carcinoma of the uterus and vagina with mesothorium. He now has 100 cases to report, the time since the end of treatment varying from twenty-one weeks to six months.

He divides the cases into the three following groups: (1) the completely inoperable cases with carcinomatous infiltration of the parametrium on both sides to the wall of the pelvis; (2) the boundary line cases, where operation is still possible but not very hopeful, in which the parametrium is involved on one or both sides, but not to the pelvic wall; (3) the favorable operable cases, in which the carcinoma is limited to the uterus.

There were 43 patients in the first group, 20 of whom died, 22 were discharged uncured and one cured. In this latter case it is probable that the involvement of the parametrium was only inflammatory. There was, however, very marked improvement in some of the other cases; there was cessation of pain and discharge and some of them were able to work for several months and thought they were cured.

In the second group there were 20 cases, with 4 deaths, 6 uncured and 10 cured, or 50 per cent recoveries. In the third group there were 37 cases, with 5 deaths, 4 uncured and 28 cured, or 75 per cent recoveries.

Baisch concludes that in completely inoperable cases mesothorium treatment generally fails also, but it is by far the best palliative treatment. In operable cases the percentage of cures is greater than that from operation after the lapse of the same length of time. In operable cases the results are better the earlier the treatment is begun.

A. Goss.

Steiger, M.: Treatment of Carcinoma of the Uterus with Roentgen Rays (*Ein Beitrag zur Behandlung des Uteruskarzinom durch Roentgenstrahlen*). *Cor.-Bl. f. Schweiz. Aerzte*, 1915, xlv, 1633.

Bumm and Warnekros reported the clinical cure of carcinomata of the uterus with very high doses of roentgen rays given within a very short period of time. Steiger tested the method on a case of very advanced carcinoma of the cervix. The result confirmed Bumm's statement that the carcinoma completely disappears and that the skin burns are benign and readily cured. But a rectovaginal fistula

was produced, which Steiger thinks was due to the rapid disintegration of the carcinoma tissue between the vagina and rectum. If the rays had been applied at longer intervals there would have been time for the development of cicatricial tissue in place of the destroyed pathological tissue. The patient's general condition also grew worse, the anæmia and emaciation increased rapidly, and she died.

Steiger thinks the method of treatment was probably responsible for the increasing cachexia in the above case; so he has since modified the technique somewhat, giving longer intervals between the treatments. He gives three treatments within a few days, then an interval of 8 to 14 days, then another series of three treatments, and so on. A series consists of the irradiation of 12 abdominal fields for eight minutes each with a surface dose of about 300 X, tubes 12 to 13 Wehnelt hardness, and 4 to 5 milliamperes current, a dorsal irradiation under the same conditions, and an irradiation through the vagina.

The details are given of three cases treated by this modified method, all of them being inoperable carcinomata in women of 73, 70, and 53 years. The first case was given in all 2,550 X, the second about 2,450 X, and the third about 2,000 X. In the last case an excised piece still shows some suspicious cells, so it is probable that this dose was a little too low. In all the cases the hemorrhage and discharge stopped, as well as the pain. The general condition has improved very much. There was no skin burn except in the third case and this recovered within two weeks. In the first two cases excised pieces showed no signs of carcinoma cells. As it has only been a few months since the treatment, it is impossible to say whether the recovery will be permanent, but the results are extremely encouraging.

A. Goss.

Warner, J. W.: Physiological and Pathological Changes in the Endometrium. *Med. & Surg. Report Roosevelt Hosp.*, N. Y., 1915, p. 157.

The author calls attention to the definite progressive and retrogressive changes that take place normally in the endometrium during menstrual activity. It is not infrequent that true physiological changes may simulate or approach those of a real inflammatory state.

A moderate degree of glandular change or increase is not pathological nor are glands distorted by the pressure of surrounding congestion indicative of inflammation when appearing in the peculiar uterine mucosa. During the premenstrual stage, during actual menstruation, and for several days after its cessation, scattered round cells may be found in

the stroma of the endometrium; unassociated with other manifestation their presence is not a basis for diagnosis of inflammation. At about the same period leukocytes are found normally in the same situation. The period at which the uterine scrapings are taken must be considered by the pathologist in making his diagnosis. In the Roosevelt Hospital it is a routine procedure to note in the history the number of days pre- or post-menstrual, or as during the resting period. One hundred and twenty-seven cases were restudied, which had been reported upon without taking into consideration the time relative to menstruation, necessitating a revision of the diagnosis in 12 per cent of the cases that had been reported as inflammatory. D. L. DESFORD.

Clogett, A. N.: Retroversion of the Uterus. N. F. M. J., 1915, 61, 1339.

The author gives a very detailed description of an operation which he contrived for the cure of retro-displacements of the uterus. He states, however, that the operation is not entirely original, but embodies ideas from the various operations that have been devised for the relief of these conditions.

Essentially, the operation is a double suspension by the round ligaments. To accomplish this the author divides the round ligaments at certain definite points equidistant from their uterine attachments, usually about one and a half inches. The distal portion of each severed round ligament is then threaded through the proximal portion of the broad ligament of the same side, and carried on beneath the peritoneum covering the uterus to a certain definite fixed point on the posterior surface of the uterus. At this point an incision one-half inch long is made through the peritoneum and the ligament emerges through this incision. The ligament of the opposite side is treated in like manner and is brought out through the same incision. The two ends of the ligaments are sutured together and then to the posterior uterine wall, after which the peritoneal incision is closed. The proximal portions of the severed round ligaments that remain are dealt with after the fashion of a modified Gilliam-Ferguson suspension by the round ligaments.

The following conclusions are formulated:

1. Occasionally this operation cannot be done because of the poor development of the round ligament muscle tissue.

2. The uterus hangs in antelexion and is freely movable.

3. The author does not know how pregnancy may be affected by this operation.

4. The uterus is held in such antelexion by the portions of the round ligament carried behind the uterus that the tugging on that part sewed to the rectus sheath is almost entirely relieved.

5. In case infection should take place in the rectus sheath a support is still provided for the uterus.

6. The uterus is protected by a double suspension.

HARVEY B. MATTHEWS.

Field, T. S.: The Surgical Treatment of Prolapse of the Uterus. J. The M. Ass., 1915, 11, 166.

Field describes an operation for prolapse which he states is not original further than as to its arrangement. He notes that there is no general agreement among surgeons as to the best relief for prolapse and that report of failures is common.

The Watkins operation is criticised upon the ground that it is unanatomical and prone to produce vesicle irritation.

The Goffe operation is recommended in complete descent and uterine atrophy.

Field accomplishes his end by employing the technique of various surgeons at different points in the procedure. The operation is well described and illustrated and the following conclusions are drawn:

1. The operation seems to be as near perfect as to anatomical readjustment as it is possible to get and achieve the desired result.

2. It is applicable to any case of uncomplicated prolapse, except where the structures are atrophied, and in this case the Goffe vaginal hysterectomy with suture of the bladder on the top of the plicated broad and round ligaments should be the procedure of choice.

3. The necessity of a good perineorrhaphy with approximation of the levator ani should be emphasized.

4. The Watkins operation necessitates sterilization, while this operation does not interfere with future pregnancies.

5. Ventral suspension does not cure prolapse. D. L. BOARDS.

Zobel, A. J.: Faecal Abscess in Pouch of Douglas, Following Typhoid. Proctologist, 1915, 11, 239.

The author states that for the past thirty years very few cases of faecal abscess have been reported in the literature. Only one of the more recently published textbooks of surgery gives even brief mention of the subject.

A faecal abscess is distinctly different from an abscess in which the pus has been so tainted by a growth of colon bacillus that from the odor it may be mistaken for faecal matter.

It may occur in connection with any portion of the intestine, and may originate either externally or from within. When it originates without it may subsequently burst into the gut, empty its purulent content, and have it replaced wholly or in part with faecal matter.

A faecal abscess which originates from within the gut usually results from a slow, progressive ulceration of the mucosa, due either to general conditions, such as typhoid fever, dysentery, tuberculosis, or cancer, or to local causes, such as chronic intestinal catarrh, stricture, a hard faecal accumulation, or a foreign body.

A report is given of a case of faecal abscess which had not only filled the cul-de-sac of Douglas, but also had invaded the tissues between the rectum and the vagina. The patient, a woman of 42, had had a

miscarriage eight years previously, and was told at that time that some kind of a swelling could be felt in her rectum. However, this gave her no trouble then, nor subsequently, and it had been entirely forgotten. When her present trouble began, two and a half months after an attack of typhoid fever, the history of this former condition complicated the diagnosis. On digital examination a large, smooth, immovable, brawny mass, beginning about 2.5 cm. above the internal sphincter, and extending beyond reach of the finger, was felt bulging from the right-lateral and anterior sides of the rectum. The mucosa was freely movable over it. No sign of fluctuation could be elicited, and no particular pain was caused by deep pressure. The temperature and pulse-rate were normal. It had been aspirated through the rectum by her physician, and a slightly turbid fluid had been withdrawn. The mass began to swell into the vagina, and in two days so occluded the passage that it almost prevented the entrance of the examining finger beyond the portal. Slight fluctuation was then felt. There was severe rectal pain. The temperature was still normal; the pulse 90. An exact diagnosis was not made before the operation. An incision was made through the posterolateral vaginal wall. Upon blunt dissection a tense sac presented. When this was punctured the contents gushed out in a thick sluggish stream which kept flowing for some little time. From its strong fecal odor and brownish-yellow, lumpy appearance it apparently consisted wholly of semiliquid, mushy feces, similar to that which is found in the lower end of the ileum and cæcum. Nearly two pints of this foul material was evacuated. Faecal drainage ceased entirely eight hours after the abscess was opened. The turbid discharge which remained rapidly decreased in quantity, and in less than four weeks after the faecal abscess was evacuated the wound was completely healed.

Although a faecal abscess is met with so rarely, the possibility of it being present should be taken into consideration in the differential diagnosis of obscure intra-abdominal tumors. The author concludes by quoting from Fenwick: "Where there is a localized abdominal swelling, immovable by the respiration or by a moderate amount of pressure of the fingers; whose size and shape alters when diarrhoea occurs; in which light percussion gives a tympanitic, and a more forcible stroke a dull sound; or in which an emphysematous sensation is communicated to the fingers, or a gurgling sound produced by percussion; it will probably be of faecal origin; and this more probably when there is a history of anything apt to produce ulceration."

Rossier, G.: *Methods of Fixation of the Uterus and Their Consequences in Obstetrics* (*Les méthodes de fixation de l'utérus et leurs suites obstétricales*). *Rev. méd. de la Suisse Rom.*, 1915, xxxv, 686.

There are many methods of fixation of the uterus; Van de Velde has counted 217. But they may all

really be divided into two classes, those in which the uterus is fixed directly and those in which fixation is accomplished by means of the round ligaments.

In choosing the operation a distinction should be made between women capable of conception and those past the childbearing age. In the latter the firmest fixation is the best; that is, direct fixation of the uterus. But all of the methods of direct fixation are followed by interference with labor and should never be used in women who are apt to have children. When the retroflexion is mobile the Alexander-Adams method is the operation of choice. In the author's experience it has never been followed by dystocia. When the retroflexion is fixed he believes that Pestalozza's method of pelvic hysterectomy is the operation of choice. There are over 200 cases on record, and in the 21 followed by pregnancy the delivery was normal. This method consists in incising a fold at the upper edge of the lower segment of the uterus. The incision is transverse, is carried a little beyond the uterus on each side, and extends down through the serosa into the fibromuscular layer. It is very important that muscular tissue as well as serosa be included. The flap of tissue thus obtained is separated by the finger up to the bladder, and then sutured to the posterior surface of the uterus, so that a cap is formed over the uterus of serosa, muscle, and connective tissue, which holds it in ante flexion but does not interfere at all with its enlarging in pregnancy.

The multiplicity of operations shows that no operation is adapted to all cases, but that there must be individualization. If a direct fixation has been performed and pregnancy occurs abdominal caesarean section should be performed to avoid the risks of delivery.

A. Goss.

Payne, R. L.: *Uterine Curettement*. *Virg. M. Semi-Month.*, 1915, xx, 449.

Payne gives the following indications for curettement of the uterus:

1. In hæmorrhage from the uterus due to incomplete abortion if the organ be too small to permit the introduction of gloved fingers.

2. Curettage is indicated in hæmorrhage due to polypoid conditions of the endometrium and in the so-called hypertrophic condition of the uterine mucosa.

3. Curettage is indicated in certain cases of fibromyoma of the uterus in an effort to arrest hæmorrhage temporarily and to permit the patient to recover somewhat from the anemia before hysterectomy is done.

4. The curette may be used to remove pieces of tissue from the body of the uterus for purposes of diagnosis in cases of suspected cancer, but in such cases the microscopic examination of the tissue should be made at once, in frozen section, and if malignancy be found radical operation must be done immediately.

5. Curettage is indicated to remove cancerous

time, preceding the use of the cautery, in carcinomatous uteri when the disease is too far advanced to admit of hysterectomy.

The contra-indications to uterine curettement are as follows:

1. Curettage is useless and therefore contra-indicated in uterine hemorrhage due to any of the numerous systemic causes.

2. Curettement is dangerous and therefore contra-indicated in hemorrhage due to pelvic peritonitis, or inflammation of the adnexa; in pelvic abscess or ectopic pregnancy, unless it is to be followed at once by appropriate operation for the existing condition.

3. Curettement can do no good and is contra-indicated in hemorrhage due to congestion from displacement of the uterus.

4. Curettement is capable of doing little good and may do great harm in cases of submucous fibroid.

5. Curettement is a highly dangerous operation in septic conditions of the uterus such as are due to the use of tents, to gonorrhea, and to infections of the puerperium.

6. Curettement is rarely of use in the more or less doubtful operation of dilatation of the cervix for dysmenorrhea. A very large number of surgeons seem to think it necessary to curette in all these operations, but it is usually unnecessary and frequently disastrous.

It would seem that uterine curettement has a distinctly limited use. It is curative in only three conditions of uterine hemorrhage and is palliative in one other.

D. L. BORDEN.

Vineberg, H. N.: Vaginal Supravaginal Hysterectomy for Prolapsed and Large Cystocele Associated with Chronic Fibrosis Uteri. *Surg., Gynec. & Obst.*, 1915, xli, 741.

Vineberg advocates vaginal supravaginal hysterectomy for cases of prolapsed uterus associated with fibrosis uteri, fibroid growths, and metrorrhagia, when the patient is approaching the menopause, or when future pregnancies are contra-indicated. He claims preference for this method over total hysterectomy, in that it leaves a good-sized cervical stump to act as a *pedic* to hold up the bladder and to prevent a recurrence of the cystocele.

The technique of the operation in the first stages corresponds to that for interposition; next, the body of the uterus is amputated as high up as conditions warrant, leaving in young women the lower portion of the body with some endometrium, together with the adnexa, so that menstruation may continue. The first suture passes through the subpubic fascia and the top of the cervical stump and, when tied, serves to bring the latter well up against the pubic arch; the remainder of the sutures pass through the vaginal wall and the anterior surface of the cervix. When the vaginal portion is very much hypertrophied or deeply lacerated, it is amputated, thus leav-

ing the portion of the cervix above the vaginal vault and the lower uterine segment to serve as the *bladder pedic*.

The author has performed the operation in ten cases. In the first case operated on over three years ago the results have been very satisfactory. The value of the method was well illustrated in one case in which an abdominal supravaginal hysterectomy had been done previously and the cervical stump sutured to the abdominal wall, and a recurrence of the prolapse of the cervical stump and vaginal walls had taken place two months after the operation.

Barbour, H. G., and Copenhaver, N. H.: The Response of the Surviving Uterus to Morphine and Scopolamine. *J. Pharmacol. & Exp. Therap.*, 1915, vii, 529.

In a series of experiments upon the uteri of freshly killed guinea pigs and cats, the author has arrived at the following conclusions regarding the effect of sulfate of morphine and hydrobromide of scopolamine (Merck). Both pregnant and non-pregnant uteri were used.

1. Morphine in concentrations of from 0.05 per cent to 0.1 per cent, and sometimes as low as 0.005 per cent, stimulates the isolated uterus to an increase in tone.

2. Scopolamine, in concentrations of 0.005 per cent to 0.06 per cent, and sometimes as low as 0.001 per cent, increases the tone of the isolated uterus. In this respect, therefore, it appears to be about ten times as powerful as morphine.

3. The inhibitory action upon the tone of the uterus, described by Kehrer for larger doses could be obtained with neither of the above-mentioned substances. Very high concentrations of either tend to produce a tetanic condition of the organ.

4. No synergism or antagonism could be demonstrated in the direct action of these drugs upon the uterus.

W. D. PHILLIPS.

Barbour, H. G.: Morphine and Scopolamine Action upon the Intact Uterus. *J. Pharmacol. & Exp. Therap.*, 1915, vii, 547.

In a series of experiments on animals, the author has arrived at the following conclusions:

1. It is possible to record conveniently the contractions of the uterus in living animals.

2. Neither morphine nor scopolamine cause profound changes in the activity of the pregnant or non-pregnant uteri of decerebrate cats. A temporary increase in tone, such as described for the isolated organ, is often seen to result from the use of both drugs. Morphine in decerebrate cats may indirectly cause a relaxation of the uterus if a marked depression of the circulation be produced (note gr.).

3. Morphine increases the tone of the uterus of rabbits under paraldehyde.

4. Doses up to 0.01 gr. each of morphine and scopolamine given together have little or no action upon the uterus.

The statement that large doses of these narcotics inhibit the activity of the uterus is not applicable to any direct action of morphine or scopolamine upon this organ. The delay in labor produced by either or both of these drugs is probably due entirely to their cerebral action.

W. D. PHILLIPS

ADNEXAL AND PERIUTERINE CONDITIONS

Landau, T.: Prognosis of Tumors of the Ovary (Zur Prognose der Ovarialtumoren). *Berl. klin. Wchnschr.*, 1915, lii, 1252.

Landau discusses papillary cystadenomata of the ovary. They are generally bilateral and show a great tendency to the formation of concretions in the papillae, even in the early stages. They often develop between the ligaments and it is very difficult to remove them intact. Even early in the development of these tumors there is frequently a dissemination of papillae on the peritoneum, and they are often accompanied by a considerable degree of ascites. The prognosis is uncertain. Formerly they were only punctured. After removal, which is now the method of treatment, there is permanent recovery in more than half the cases, even when there is already dissemination over the surface of the peritoneum.

Many cases have been described in the literature in which these metastases underwent retrogression after the removal of the primary tumor. But it is quite possible for them to persist and give rise to ascites after many years of very slow growth. For this reason it is not safe to count on permanent recovery, even after the lapse of the usual five years. Landau gives the details of two cases in which there was recurrence after eight and ten years respectively. In one of these cases the recurrence showed carcinomatous degeneration; in the other it was the same kind of structure as the original tumor. He has had 57 cases thus far, and has had reports from 23 of them some years after operation. Of the 23, 10 have been well for more than nine years since the operation.

A. Goss.

Cole, H. P.: Local Anesthetic Laparotomy for Forty-three Pound Multilocular Ovarian Cyst in a Patient Seventeen Years of Age. *South. M. J.*, 1915, viii, 1263.

Cole reports a very interesting case of a 17-year old girl from whom he removed a 43-pound multilocular ovarian cyst.

The patient gave a history of a gradual enlargement of the abdominal tumor of two years' duration. There were no uterine or vesical symptoms. A few months prior to the time of operation there was an increasing dyspnea and lassitude and edema of the ankles and eyelids. Otherwise, there were no symptoms of sufficient severity to warrant any complaint.

Physical examination showed, besides this large ovarian cyst, a chronic parenchymatous nephritis and mitral insufficiency. Naturally, there was

upward displacement of the heart with subdiaphragmatic compression of the thorax.

In view of such complications, local anesthesia was used throughout the operation. There was almost total absence of shock and the patient made a very satisfactory recovery.

In conclusion, the author believes there is a definite field for local anesthesia in the large, freely movable abdominal tumors or fluid accumulations producing pulmonary, cardiac, and renal complications by pressure.

HARVEY B. MATTHEWS.

EXTERNAL GENITALIA

Franqué, von: Racemose Vaginal Sarcoma in Children (Traubiges Scheidensarkom der Kinder). *Deutsche med. Wchnschr.*, 1915, xli, 1362.

Von Franqué demonstrated an 18-month-old, apparently healthy child with an irregular protrusion of the anterior wall of the vagina. This was the second recurrence. First there was a racemose proliferation of tissue resembling a cock's comb projecting from the vagina, which was removed in August, 1915. Six weeks before, the parents had noticed a red nodule projecting from the vagina, which the physician removed, but it soon recurred. This course is typical of these growths. About 50 cases have been published, and only one has remained free from recurrence after operation.

Generally these growths look like perfectly innocent polyps at first, but they recur soon after removal, and are followed by cystitis and pyelonephritis, and finally general sepsis and death. Even abdominal extirpation of the whole genital tract has been performed in 6 cases without success. This is one reason why von Franqué did not perform abdominal operation in this case as soon as the growth recurred. He also wished to examine it as to malignancy. After removing as much of the growth as possible he instituted radium treatment, believing that it should be particularly effective in a case of this kind, as embryonic tumors are very sensitive to the rays, and this one was readily accessible. He gave five treatments of one to three hours, with intervals of one to three days, using 60 or 80 mg. radium bromide in a 1.5-mm. brass filter. The child's general condition improved and she increased in weight 7 pounds. Then incontinence of urine developed and as it was uncertain whether it was due to temporary irritation of the bladder from the radium or to a recurrence of the tumor involving the bladder, treatment was suspended for two weeks, as it was desirable anyway to see what effect the radium was having on the tissues.

Ribbert assumes that these tumors develop from precursors of the sexual cells, which in the course of their migration to form the ova of the new individual become displaced and give rise to later abnormal proliferation. This displacement takes place while the germinal tissue is still undifferentiated. Any polypous growth in the vagina of a child should be regarded as suspicious, and even if the histological

picture is doubtful, if it recurs once it should be subjected either to radical operation or to very vigorous radium or mesothorium treatment. A. Goss.

MISCELLANEOUS

Olivier, Pulmonary Tuberculosis and Sterilization (*Tuberculose pulmonaire et stérilisation*). *Rev. méd. de la Suisse Rom.*, 1915, XXXV, 780.

Olivier gives the histories of nine cases in which women with progressive tuberculosis were sterilized by salpingectomy for the purpose of preventing further conceptions. There was improvement in the general health of all the women and apparently retrogression of the tubercular process. She recommends this operation for multiparae of the working class who have active tuberculosis, because of the high mortality of pulmonary tuberculosis as a result of repeated pregnancies, because these people will not take advice or remedies directed toward the prevention of conception, because of the impossibility of giving them adequate sanitarium treatment, and because of the harmlessness and good results of tubal sterilization performed at the same time that abortion is done. If abortion alone is performed and the woman not sterilized she is subjected to all the dangers of future pregnancies and abortions.

Sterilization is not indicated for tuberculosis in well-to-do patients, because with proper care and precautions they may either prevent conception or by proper rest and treatment they may even undergo pregnancy and delivery without seriously impairing their chances for recovery. A. Goss.

Outerbridge, G. W.: The Occurrence of Chorion Epithelioma Following a Long Period of Latency After the Last Preceding Pregnancy. *Am. J. Obst. & N. Y.*, 1915, LXIII, 952.

The author reports a case in a woman, aged 43 years, of a vaginal tumor presenting the histologic structure of a malignant chorion-epithelioma eight and a half years after the last demonstrable pregnancy. It seems probable, he thinks, that we may account for such a condition on the theory that, whereas in the vast majority of cases all fetal elements are destroyed by the maternal tissues within a comparatively short time after the termination of pregnancy, in exceptional cases fetal epithelia may remain dormant in the maternal organism, either in the placental site or elsewhere, for months and years, and then be by some unknown agency stimulated to malignant proliferation. Several apparently well-authenticated cases have been collected from the literature in which the period intervening between the last period and the development of the chorion-epithelioma amounted to more than five years, and one in which onset still were found in a uterus eighteen years after the last pregnancy, without any malignant development. He thinks it of considerable interest to note that in some of these cases of long latency the chorion-

epithelioma developed after the menopause, a circumstance that would seem sufficient to disprove the theory that in all such cases an undetected pregnancy has in reality intervened shortly before the development of the tumor. The fact that in six of nine cases of long latency the age of the patient was fifty years or more is also of significance in this respect. He says that we must bear in mind, therefore, that apparently malignant chorion-epithelioma may develop after the lapse of much longer intervals in which no pregnancy has occurred than is commonly thought possible, so that in the presence of suggestive symptoms this condition should be thought of in considering the diagnosis, even in the case of elderly patients near or beyond the menopause. C. H. Davis.

Frank, R. T., and Rosenbloom, J.: Physiologically Active Substances Contained in the Placenta and in the Corpus Luteum. *Surg., Gynec. & Obst.*, 1915, XXI, 646.

This preliminary report shows that by concentration physiologically active substances can be obtained from both the placenta and the corpus luteum. These substances may be lipid in nature or may be carried along by the lipoids. The effect produced is marked hypertrophy of the uterus, independent of ovarian action (castrates). The breasts also hypertrophy to a minor degree.

Schmitt, A. H.: The Anatomical and Physiological Basis of an Abdominal Support or Corset for Women. *Am. Med.*, 1915, I, 928.

The author discusses the anatomy and physiology of the abdominal muscles and gives the various functions of the same, and then gives his ideas as to the correct construction of a corset based on the above principles.

The principal feature of a scientific corset is what may be termed a cast of the recti and oblique abdominal muscles. The imitation should be so perfect that even Poupart's ligament is included. Just as the oblique muscles interdigitate with the important muscles of the back, so in like manner should the rear of the corset anchor or fix the front portion when properly adjusted. The lower border should attach itself to the crest of the pubis and then run obliquely upward and outward, following the course of Poupart's ligament. In the scientific corset, that part of the corset corresponding to the recti muscles should relax or bend outward when sitting, imitating exactly the normal function.

R. H. KUHN.

Bonney, V.: Review of Modern Gynecological Practice. *Lancet*, Lond., 1915, CLXXX, 1285.

The author discusses the more common pelvic conditions and their treatment. He believes that in spite of favorable reports of the treatment of fibroids of the uterus by radium and X-ray exposure, surgical treatment is by far the safest and most satisfactory, and reports several cases in which

delay in operation has been followed by development of malignancy and other serious complications.

He takes up the question of myomectomy, particularly its relation to pregnancy, citing an interesting case of his own which had been referred to him with a diagnosis of fibroids and pregnancy. With the patient at full term he did a caesarean section and removed the tumors satisfactorily. A year later the patient again became pregnant. A second caesarean section was performed and the uterus was found in an apparently perfect normal condition.

Regarding the conservation of ovaries in subtotal hysterectomy for fibroids, he believes that both should always be left, if healthy.

He says that until irradiation treatment is shown to produce a specific effect on the tumor, leading to its complete disappearance, the treatment is to be regarded as equivalent to double oophorectomy.

In cancer of the uterus he speaks of the great advancement in operative results since the introduction of abdominal hysterectomy. He is very pessimistic in regard to vaginal hysterectomy. From his own experience he claims that the ultimate results, even with careful secretion, were very poor following vaginal hysterectomy and that 9 out of every 10 cases which recovered from operation died from recurrence. He quotes Wertheim, who has an operability rate of 50 per cent, and a cure rate, estimated on the number of patients recovering from the total abdominal operation and remaining free from recurrence for five years, of about 53 per cent, which gives an achievement rate of 18 per cent. In his own results he bases his figures on a three-year period, from 1907 to 1910. During that time 112 cases were observed, of which 71 were operated upon, an operability rate of 66 per cent. The primary mortality in these 71 cases was 22 per cent. Of the 55 patients who survived, 20 died from recurrence, 2 from intercurrent disease, 3 were still alive, but had recurrent growth, 2 had been lost sight of (both were alive three years after the operation), and 28 remained alive and free from recurrence, at periods varying from three to nearly six years since the date of their operation. Their actual achievement, therefore, based on the number of cases seen and on three years' freedom from recurrence, was 25 per cent. He makes note of the fact that 9 per cent of recurrences take place during the fourth and fifth years.

He discusses the limitations of the operation and refers to the fact that a thickened condition at the base of the broad ligaments is often inflammatory. He says in 5 of 28 cases free from recurrence, after

periods varying from three to six years, the removed glands were carcinomatous on macroscopical examination.

For cancer of the body of the uterus he advocates a simple total hysterectomy.

He has apparently had considerable personal experience with the use of radium and states that although it produces a remarkable improvement, or even apparent disappearance of the growth, this improvement or disappearance is very rarely of long duration. He has seen no case in which a cure could be claimed, on a three years' freedom from recurrence basis. He says that in a certain proportion of the cases the growth appears to show no improvement after treatment and that there is a third group in which the patient is often worse following treatment; also that treatment by radium is apt to be followed by fistulae in the bladder or rectum.

In the treatment of salpingitis he urges conservative measures with conservation of the whole or a part of the ovary, and in a certain proportion of tubes sealed up by chronic inflammation he suggests salpingostomy.

As regards displacements, he favors as a prolapse operation a plastic procedure consisting of a perineorrhaphy, anterior colporrhaphy, shortening of the lateral cervicopelvic ligaments, amputation of the vaginal cervix, and ventrofixation. He does not discuss the selection of operation according to the patient's age, but apparently uses this method in all cases.

He claims that hysterectomy is absolutely contra-indicated for prolapse, which is contrary to the opinion of the majority of surgeons in this country, and believes the interposition operation of Watkins is inferior to his method.

Other conditions, such as uterine fibroids, endometritis and cervical erosion, dysmenorrhœa and carcinoma of the vagina and vulva, are discussed, but there is nothing new suggested.

As to the treatment of carcinoma of the vulva, he speaks encouragingly of irradiation following removal of the growth, together with the inguinal and saphenous glands.

In closing he mentions the changing status of gynecology in Great Britain, stating that specialists are a necessity for the advancement of any science or art, but in gynecology at all events, pure specialism is a danger, and he believes that a gynecologist of to-day should be an expert abdominal surgeon, especially expert in pelvic operations.

D. C. HALPHUR

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Pierce, F. A.: Cystoscopic Examinations During Pregnancy. *Trans. M. Soc.*, 1915, XXV, 256.

The author urges cystoscopic examinations for the diagnosis of bladder symptoms during pregnancy.

Of the three abnormal kidney conditions to be most looked for in pregnancy, pyelitis occurs most frequently and may be acute or subacute. It usually occurs during the last three months of pregnancy. The bladder and ureters should be investigated, and if a growth is obtained from culture of the urine, an autogenous vaccine may be made and given the patient.

Hydronephrosis and renal or ureteral calculus are the other abnormal kidney conditions.

The ideal solution for use in pyelography, according to the author, should be non-toxic, non-irritating, and quite fluid, so as to escape readily from the ureters and bladder, and it should cast a good shadow.

In the author's opinion Burn's solution of thorium nitrate more readily meets the above requirements than any solution yet discovered.

For determination of the presence of a stone, the X ray is of the utmost value. In ureteral calculus filling the ureter and kidney with the thorium solution will aid in a differential diagnosis of phlebolith.

The author reports the case of a woman, 22 years old, a primipara, who had a characteristic attack of pain, chill, and fever, and a diagnosis of pyelitis was made. Cystoscopy and ureteral catheterization were done, and just as soon as pressure was relieved from the kidney the patient was perfectly comfortable. Further catheterization and irrigation of the kidney continued to give the patient relief and she went to term and had a normal delivery.

R. H. Kohns.

Taylor, H.: Cases of Ectopic Pregnancy at the Roosevelt Hospital from June 1, 1909, to December 31, 1914. *Med. & Surg. Report Roosevelt Hosp.*, N. Y., 1915, p. 147.

There were 46 cases diagnosed as ectopic pregnancy, 33 of which were ruptured and 13 unruptured. Where active bleeding was believed to be taking place, operation was done at once if the patient's condition permitted. If the case was unruptured or was a pelvic hematocoele, operation was delayed until the general and local condition seemed to be favorable for the operation.

In cases where doubt existed as to whether there was a pelvic hematocoele and inflammatory disease of the appendages, it was thought best to delay

operation. The average delay for observation was about four days. The longest delay for the rupture case was nineteen days and sixteen days for the unruptured.

In 75 per cent there had been a period of sterility of at least five years just previous to the ectopic pregnancy; 76 per cent gave a history of inflammation of the appendages; 81 per cent gave a history of menstrual irregularity. In 69.6 per cent of ruptured cases there was acute localized sharp pain, nausea, vomiting, and fainting. Of the unruptured cases 92.3 per cent complained of pain on the side of the diseased tube. The breasts were enlarged and tender in 44 per cent of the cases; in 11 per cent they showed no change. Blood examination in the unruptured cases showed little or no change. In the ruptured cases the average white count was 14,430 with 83.7 per cent polynuclear cells. The highest count was 24,000 white cells.

Operation. In cases of doubt the vaginal route was used for diagnosis for small hematocoeles and for septic infection of the pelvic hematocoele. The abdominal route was used for all unruptured tubal pregnancies and all ruptured cases that were not included under the indication for the vaginal route.

Posterior colpotomy was used twice in ruptured cases alone, and twelve times combined with the abdominal route, of which 11 were ruptured and one unruptured. The abdominal route alone was used in 20 cases of ruptured ectopic pregnancy and 12 times in unruptured cases.

There were 4 deaths, 3 of which had gone beyond the fifth month, 1 died of shock and hemorrhage, and one from septicemia. Of 14 cases of the series followed as to subsequent pregnancies, 3 had intra-uterine pregnancies, and 4 had subsequent extra-uterine pregnancies.

D. L. DOWARD.

Lichtenstein: Autotransfusion of Blood in Extra-uterine Pregnancy and Rupture of the Uterus (Eigenbluttransfusion bei Extrauterin-gravidität und Uterusruptur). *München. med. Wochenschr.*, 1915, LIII, 1597.

Severe anemias were formerly treated by transfusion of blood, but it was found that the blood of animals had a hemolytic action on human blood and was dangerous, and when human blood was transfused generally not more than 100 to 200 ccm. was used. This was not enough to compensate for a loss of 1,000 to 1,500 ccm., for a certain volume of fluid is necessary to enable the heart to function properly. In order to supply the volume salt solution was injected, and in some cases has proved very useful; nevertheless many cases were lost, and some authorities even think that the transfusion of salt

solution was responsible for the death in some cases on account of its extreme dilution of the blood.

Lichtenstein describes two cases of severe hemorrhage from extra-uterine pregnancy which he treated in 1913 and 1914 by transfusion of salt solution, with the death of both patients. Thies first suggested the reinjection of the blood that collected in the abdominal cavity in such cases, after diluting it with salt solution 3:2. He treated three pulseless women in this way and they recovered very rapidly without having any fever. The objection has been urged that the blood might clot and cause fatal embolism, but this may be obviated by beating it to defibrinate it. Lichtenstein has since treated 8 cases in this way: 7 of extra-uterine pregnancy and one of rupture of the uterus. The patients recovered rapidly, the pulse particularly showing the most remarkable and rapid recovery. There was only slight fever in one or two cases, and the patients showed no anemia afterward. At least four of the cases were as severe as the two that he lost after transfusion of salt solution. In fresh hemorrhage from a ruptured tubal pregnancy the abdominal cavity and the blood are sterile, so there is no danger of infection from transfusion. This is not always true in rupture of the uterus. The author's case was particularly favorable, as it was a rupture of an old caesarean scar, and the membranes were still intact. The placenta had been torn in the rupture and the bleeding was from this. It remains to be seen from experience just what cases of rupture of the uterus are adapted to the method, though in cases that seem hopeless from loss of blood it may be justifiable to incur some danger of infection for the chance of saving them.

The blood is dipped out of the abdominal cavity into a vessel containing a little Ringer's solution. It is then beaten and strained into another vessel containing enough Ringer's solution to dilute it properly. To keep the blood at body temperature it is placed in a water bath till the abdominal operation is finished. The vein in the arm is located and the blood run into it from a glass funnel and tube. The author has recently devised an apparatus similar to that used for the injection of salvarsan and finds it better than his old technique.

A. Goss.

Nash, C. C.: Tubal Pregnancy. *Texas M. News*, 1915, XIV, 247.

Nash points out the following essential points in the diagnosis of tubal pregnancy: the missing of one or more periods, with irregular flowing and a feeling of discomfort in the side of the pelvis involved; the occasional passing of shreds of decidua; the revealing by bimanual examination of a tender mass in the pelvis. Any increase in symptoms or in the size of the tumor should point to immediate laparotomy.

After rupture, the diagnosis of which is unmistakable, the abdomen should be opened forthwith. Speed is essential, and hemorrhage should be con-

trolled first. The evacuation of free blood and clots is best postponed until after the diseased tube is found and removed. This is best accomplished by locating the fundus uteri, drawing it up into the wound, and clamping off the ruptured tube.

F. C. IRVING.

Galloway, D. H.: Double Tubal Pregnancy, Both Ruptured. *Am. Med.*, 1915, 2, 917.

The patient, after missing a period, had a slight uterine hemorrhage for two weeks. Her temperature varied from 99 to 102°. A curettage and examination under anesthesia showed a slightly enlarged uterus and an indefinite fullness in the right vault.

Five days later, the mass increasing, a laparotomy was done. On opening the abdomen an intraligamentous rupture of a right ectopic pregnancy and a post-uterine mass, involving the left tube and ovary, were found. No embryos were discovered. Both adnexæ were removed and the patient made a good recovery.

F. C. IRVING.

Winter, G.: Treatment of Eclampsia by the Practicing Physician (Die Behandlung der Eklampsie durch den praktischen Arzt). *Med. Klin.*, Berl., 1915, XI, 1337.

For a number of years up to the introduction of Stroganoff's treatment, eclampsia had been more and more referred to the specialist for treatment, for the removal of the source of intoxication by immediate delivery, generally by caesarean section or by difficult methods of dilatation, was regarded as the only logical treatment. But Stroganoff emphasized the importance of the measures which had heretofore been regarded as of secondary importance. His treatment consists in placing the patient at once in a darkened room, removing all sources of irritation, administering chloral and morphine systematically, giving the necessary attention to heart and kidneys, and delivering when the os is fully dilated. A further valuable addition to the treatment is the removal of about 600 gm. blood.

The treatment requires close care and attention on the part of physician and nurse, but excellent results have been obtained. Stroganoff himself reports 7 per cent maternal mortality in 1,085 cases; Lichtenstein reports 6.2 per cent from the Zweifel clinic, and 13.5 per cent in a series of cases collected from the literature.

Winter discusses the comparative value of the operative and Stroganoff methods, and concludes that the results of the former are probably better if the case is seen very early. The infantile mortality is less with operative delivery. But if the case is not seen early, or if it would require a considerable time to reach the hospital, it is better to give the Stroganoff treatment at home. If women at term show decided albuminuria, headache, and vomiting, disturbances in vision, motor restlessness, and slight psychic disorders it is advisable to induce delivery as a prophylactic measure, though of

course it is impossible to say definitely that such cases would develop eclampsia if not so treated.

A. Goss.

Huesey, P.: Symphysiotomy or Caesarean Section (*Symphysiotomie oder Kaiserschnitt*). *Arch. f. Gynaek.*, 1915, cv, 348.

Huesey gives the histories of 8 cases which he has delivered by Frank's method of subcutaneous symphysiotomy. He concludes that it is a decided advance in operative obstetrics. Both the maternal and fetal mortality is very slight, even when the severest cases are counted, and especially when it is considered that it is an operation that has to be performed to save the child.

The technique is relatively simple and without danger, though not so easy as might be supposed at first thought. Injuries of the bladder can generally be avoided by careful technique. In one of the author's cases there was a bladder injury on account of an anomalous position of the bladder, but it had no serious results. He has never had hematomata, but in one case a severe thrombophlebitis followed the operation; it did not lead to embolism, however, and the patient recovered.

Fever during delivery is not a contra-indication to subcutaneous symphysiotomy. It is indicated in case of contracted pelvis with a true conjugate down to 7 cm., which does not absolutely prevent spontaneous delivery. Operation should be performed only after Walcher's position and the administration of oxytocics have failed. It need not be performed so long as the fetal heart sounds are normal. It takes the place of perforation of the living child. It would be an excellent operation for general practice if the technique were not somewhat difficult. However, the practicing physician may perform it when a living child is very much distressed, if he points out the injuries to the soft parts that may take place in the hands of one not specially skilled. Hysterotomy and other methods of operation on the pelvis should be abandoned in favor of Frank's subcutaneous symphysiotomy, but it will not replace caesarean section, for which the indications are somewhat different. Its disadvantage in comparison with caesarean section lies in the higher infantile mortality; its advantages in the easier technique and the low maternal mortality.

A. Goss.

LABOR AND ITS COMPLICATIONS

Phillips, J.: Double Episiotomy During Labor. *Lancet, Lond.*, 1915, clxxix, 1136.

The value of this operation as a means of preventing perineal lacerations the author thinks is not sufficiently recognized. As the occiput begins to protrude through the vulva, a finger is introduced into the vagina. When the proper moment arrives an incision one to one and a half inches long and a quarter of an inch deep horizontal to the long axis of the body is made with a blunt pair of strong scissors.

This incision at right angles to the vulva affords more expansion and no danger and is situated where the anterior and posterior vaginal walls fall together. Two theoretical objections have been offered to this procedure: that the vulvo-vaginal gland may be severed, and that the bulbous vestibule may be wounded. The cut should be anterior to the duct of the gland and should never be deep enough to injure the vessels.

Indications for the operation are: (1) an exceptionally large head; (2) a long and rigid perineum; (3) atresia, congenital or acquired, of the vagina; (4) a threatened central rupture of the perineum; (5) an unreduced occipitoposterior presentation, where restitution is impossible; (6) in breech cases in which the after-coming head has to be rapidly delivered, owing to threatened stillbirth of the child; and (7) a narrow pelvic arch, as is present in the "male" type of pelvis.

C. D. HODGINS.

Williams, J. T.: Episiotomy. *Boston M. & S. J.*, 1915, clxxii, 946.

Episiotomy today has one indication; namely, the prevention of complete tears in the perineum. Properly used it should practically eliminate complete lacerations of the perineum from gynecology. It should not be performed except to prevent a complete tear, because incomplete tears heal as well as episiotomy wounds and are less difficult to suture.

Complete lacerations of the perineum are especially to be feared in:

1. Contractions of the inferior straight.
2. Rigid perineum, as in late primigravida.
3. Short perineum.
4. Unusual size of fetal head.
5. Aftercoming head in breech presentation.
6. Face presentations.

D. L. BORDEN.

Buhls, J. L.: Small Doses of Pituitrin in Obstetrics. *Surg., Gynec. & Obst.*, 1915, xvi, 479.

Pituitrin, when used in small doses, i.e., two or three minims, may be safely administered during any stage of normal labor. In the author's experience with 150 cases, the best, promptest, and most uniform results were obtained when the drug was given undiluted into the biceps muscle. No infection of the arm followed, although some patients complained of pain immediately afterward which disappeared within one or two days.

The labor pains generally began promptly. The longest time before a definite action occurred was twelve minutes. A 1-ccm. ampule may be used for several cases.

Prior to January, 1912, 1-ccm. doses were used. These, however, often caused severe reactions characterized by excessive, continuous, almost tetanic-like bearing-down labor pains. The suffering and danger to the mother and child prompted the use of smaller doses.

In 29 primiparae and 67 multiparae only one injection was required. Two to four injections were given

in 13 cases, 5 of which were primiparae. Forceps were used to assist in the termination of labor in 26 cases, 16 of which were primiparae.

Good results were also obtained in breech and twin cases, in premature and induced labor, and in dry birth. Bronchitis and asthma complicating labor were favorably influenced.

Malposition of the foetus is an absolute contra-indication to the use of the drug.

After an injection of pituitrin the patient should not be left alone. Strong after-pains generally occur, and relaxation of the uterus followed by severe post-partum hæmorrhage may occur.

PUERPERIUM AND ITS COMPLICATIONS

Morse, A.: Creatin and Creatinin Excretion During the Puerperium and Their Relation to the Involution of the Uterus. *J. Am. M. Ass.*, 1915, LV, 1613.

The author's conclusions are based on the observations of four types of cases: (1) a normal labor; (2) a conservative cesarean section at the end of a normal pregnancy; (3) a conservative cesarean section in a case of pre-eclamptic toxæmia; and (4) two cases of cesarean section with removal of the uterus. A material so varied has enabled him to learn in the first place that the creatin and creatinin metabolism is practically identical after normal labor and after cesarean section, provided the uterus is not removed and the pregnancy has not been complicated by a toxæmia. And, in the second place, he has been able to compare the excretion of these substances in cases in which the uterus was undergoing involution with others where the uterus had been extirpated.

The results of the Kjeldahl determinations indicate a notably smaller output of nitrogen in case hysterectomy was performed.

In its behavior the creatinin elimination resembles that of total nitrogen; larger amounts are excreted in case the uterus is undergoing involution. During the first thirteen days of the puerperium, the mean average daily output of creatinin was found to be 1.00 gm. in two cases in which the uterus was undergoing involution, and 0.897 in two cases in which the uterus had been removed. Later in the puerperium the excretion of creatinin has always been lower than during the first two weeks.

The explanation for the creatinuria of the puerperium is doubtful. Observations not only make untenable the involution hypotheses of Schaffer and Murlin, but they also fail to support Mellanby's hypothesis attributing the phenomenon to a failure of excretion of the creatin through the milk. The author's cases showed marked creatinuria even though the breasts were functioning normally.

From observations made on four cases in which cesarean section was performed, in two instances without removal of the uterus, and in two instances with hysterectomy, the following conclusions may be drawn:

1. A lower total nitrogen output is observed in case hysterectomy is performed, and the higher output of nitrogen observed when the uterus is left *in situ* is explained by the involution process.

2. A lower creatinin output occurs in case of hysterectomy and at least 2 grams of this substance excreted during the puerperium arise from the involution of the uterus.

3. Creatin in large amounts regularly appears in the urine following childbirth. The creatinuria is independent of the involution of the uterus, and it is also independent of the creatinin metabolism.

EDWARD L. CORNELL.

Browning, A. W.: Puerperal Septicæmia. *J. So. Car. M. Ass.*, 1915, VI, 392.

The author briefly reviews the history of puerperal sepsis and gives the most frequent symptoms of the disease. In regard to prophylaxis, he earnestly recommends the thorough application of the nail-brush to the physician's hands, careful cleansing of the patient, and adequate sterilization of the gloves and instruments.

The treatment includes the use of various supportive measures, such as whisky, strychnine, camphorated oil, and free nourishment. An ice-cap is placed over the fundus, ergot administered, and three grains of quinine and urea given subcutaneously every four to six hours for a few days. In the event of severe infection digital exploration and the removal of any uterine débris is advised, as well as the use of an intra-uterine douche of 50 per cent alcohol. The curette is always contra-indicated.

F. C. IRVING.

Betta, N. S.: The Treatment of Puerperal Infection. *Hahneman. Month.*, 1915, I, 853.

For the purpose of discussion the therapy of infections originating in the puerperal uterus or birth canal may be classified as follows:

1. To the uterus direct—with the object of destroying bacteria or lessening their infectivity.

2. General supportive measures tending to increase the vital resistance of the patient.

3. The destruction of septic organisms circulating in the blood.

In the field of local treatment of the uterus the widest difference of opinion exists among authorities both in this country and abroad. Today the pendulum seems to be swinging well over toward conservatism in the management of this condition. If it becomes necessary to explore the uterine cavity for the presence of placental fragments it is done very gently with a finger of the gloved hand. Free drainage must be maintained, good elimination secured, and a nourishing liquid diet crowded to the limit of digestive tolerance. Hot douches—115° to 120°—of a gallon each, given slowly, seem to stimulate pelvic contraction and hasten involution.

Absolute contra-indications to intra-uterine manipulations, in the author's opinion, are the presence of phlebitis, pelvic abscess, peritonitis, gonorrhœal

and pure streptococcal infections, lymphatic septicaemia, and where it is positively known that the uterus contains no foreign fragments. Additional supportive measures, as absolute mental and physical rest, fresh air, sunlight, etc., are helpful.

The use of systemic antiseptics, serums, vaccines, etc., has not met with the most flattering success.

Surgically the two procedures most often advocated are extirpation of the uterus and ligation of the pelvic veins to prevent the extension of a thrombophlebitis. In this country neither of these measures has been found of established value in such cases.

In conclusion the author emphasizes the following points:

It is safer and wiser to err on the side of conservatism and non-interference in the pelvis than of a too radical treatment of puerperal infections.

Specific vaccines and serums, to be of value, must be given early in the disease.

The greatest gentleness must be exercised in all intra-uterine manipulations. Only gross masses of foreign tissue are to be removed and the uterine wall should never be scraped or unduly injured. It is as logical to curette an acute abscess elsewhere, or to scrape out the lining of a diphtheritic throat, as to curette a uterus under such circumstances.

C. D. HOLMES.

Manning, L.: Treatment of Puerperal Infection. *Clinique*, Chicago, 1915, XLV, 500.

In discussing the prophylaxis of puerperal infection Manning mentions the treatment of existing local and general infections. The patient should avoid self-examination and coitus during the last month of pregnancy. As incidents to the curative treatment the author advises ergot and hydrastis or quinine. Wounds of the genital tract are touched with iodine. Vaccines have given only fair results. Surgical treatment consists in the drainage of pus-tubes, hysterectomy, and ligation of the pelvic veins.

F. C. IRVING.

MISCELLANEOUS

Holmes, R. W.: Obstetrics, a Lost Art: a Criticism of the Promiscuous Indications for Cesarean Section. *Surg. Gynec. & Obst.*, 1915, VII, 636.

A brief discussion is presented which covers the methods of delivery of the child through the natural channels, and the fact is emphasized that the possibilities of correctional means for the purpose of securing delivery are too largely forgotten. Likewise, the various means of securing dilatation of the os are neglected in the erroneous belief that cesarean section overcomes all difficulties and dangers. The scope of section in contracted pelvis is discussed, also the fact that pelvic contraction *per se* is not the indication, but that the necessity arises only when there is a true cephalopelvic contraction. A criticism is presented of the widespread use of section in eclampsia and placenta previa, and in many very spurious indications which most properly should

have small place in the justification of a section. As it is, Holmes believes that too many sections are done for practically no reason of scientific worth, as, for instance, transverse, face, brow, or even breech presentations.

He advocates the routine employment of rectal examination during labor, especially where the possibility of a cesarean section is under advisement, as a prophylactic against infection.

He maintains that no matter for what a cesarean section may have been done, the presence of the uterine scar places a great hazard on the mother, and it alone should demand a section in all subsequent labors. If the truth were known rupture after cesarean section is far more common than statistics would lead one to believe.

It behooves the obstetric attendant to develop his obstetric skill and knowledge so that he may acquire a dexterity which will preclude the resort to an unjustifiable section.

Gluffrida, P. J.: The Abuse of Pituitrin, Intrapartum. *J. Res. Med.*, 1915, LV, 394.

It is nothing less than meddlesome midwifery to employ pituitrin or any other uterine stimulant just because the obstetrician is tired of waiting for spontaneous labor to terminate. Ruptured uterus, badly torn cervix and perineum, postpartum hemorrhage, stripping the bladder from its peritoneal attachment, and asphyxia of the child—any or all of these are some of the calamities that may turn the tide of a normal labor into a most serious pathological condition by the ill-advised employment of pituitrin.

C. D. HOLMES.

Schatz, F.: Causes Which Influence Presentation at Delivery (Die Ursachen der Kindeslage). *Arch. f. Gynæk.*, 1915, XLV, 505.

This article of 78 pages is a continuation of a previous one on the same subject. The author has made a very extensive clinical study of the subject and upon it bases an explanation of the mechanism of the changes in position of the fetus during pregnancy, the influence of the position of the uterus upon that of the child, and other factors. He made repeated examinations of pregnant women near term in both reclining and standing positions and reports the results in 140 tables.

The influence exerted upon the position of the fetus by its size and sex, by the time of day, by the contractions of the uterus, the influence of preceding deliveries, etc., is discussed in detail. The chief factor in the change of position seems to be the efforts of the fetus to stretch its limbs. He found that fetuses show as marked individuality as do infants after birth. Some of them were very active and responded promptly to changed conditions, while others were very sluggish and seemed not to be affected by anything but the law of gravity, so that they settled into a breech position and remained in it.

A. Goss.

Cartledge, E. C.: *Childbirth; Early Rising After.* *J. Res. Med.*, 1915, lvi, 391.

The author's rule as to the time when the mother should be allowed to rise from childbed is that she may get up when she feels strong enough. The knee-chest posture can save the patient from the only harm that can come from getting up too soon and being on the feet too soon, except, of course, the harm there is always in that effort and exercise which approaches fatigue. Every mother should be allowed up enough to rest herself, beginning anywhere from the fifth to the twentieth day, and she should be properly instructed in the use of the genupectoral position. C. D. HOLMES.

Schumann, E. A.: *A Study of Hydrops Universalis Fetus.* *Am. J. Obst.*, N. Y., 1915, lxvii, 961.

The author reports the case of a female child, weighing 7.5 pounds born to a healthy II-para, aged 23 years. It was the seat of a marked general edema, involving the head, trunk, and extremities. The facial edema was so marked as to almost obliterate the features; there was a large ascites, hydropericardium, and hydrothorax. The placenta weighed 4.5 pounds. It was soft, friable, pale, and enormously edematous. On section serous fluid escaped from all parts.

Microscopically the villi showed great edema and some degeneration of the syncytial cells. The villi presented vacuolation, there was separation of the connective tissue by edema, and the syncytial cells were swollen, their nuclei pale, and in many instances shrunken.

The mother made an uneventful recovery. During this pregnancy she had shown a trace of albumin in the urine on occasions, but had not been ill or shown signs of serious disturbance of the kidney, although she gave a clinical impression of suffering from some toxemia.

After reviewing the literature and discussing the various theories advanced by the different writers on the subject, the author says: "The entire problem may be briefly summarized in the statement that hydrops universalis fetus is a condition characterized by a general edema of the fetus, associated with a great variety of visceral changes and diseased states of the body fluids, or it may present no organic change whatever, even to the most painstaking pathological examination, except of course the presence of abnormal amounts of serous fluid.

"The condition is usually present in women who have shown the existence of some gestational toxemia, or in whom the presence of some toxic factor is suspected but cannot be confirmed.

"It is almost always associated with edema and degenerative changes in the placenta, the microscopical picture of which is very similar in general to that shown in the present case.

"In the opinion of the author, hydrops universalis fetus is due to a maternal toxemia impairing the

circulation and the nutritive function of the placental cells, and thereby causing secondary circulatory and nutritional defects to ensue in the fetus."

C. H. DAVIS.

Holmes, R. W.: *Rectal as a Substitute for Vaginal Examinations in Labor.* *J. Am. M. Ass.*, 1915, lvi, 1909.

In spite of the most rigid regard to the details of asepsis in the preparation of the patient, of the attendant's hands, and of the supplies to be used, the dangers of puerperal infection have not been reduced to that negligible degree which should be attained. Today it is generally recognized that abdominal palpation, aided by a proper interpretation of clinical evidences, offers as much, if not more, certitude as to the condition of the woman and progress of labor than do vaginal examinations alone. The elimination of the necessity of entering the vagina, or at least reducing the frequency to the point at which imperative exigency demands it, will be a distinct obstetric advance.

The technique is outlined, together with the findings it is possible to obtain.

The conclusions are as follows:

1. The discovery by Kroenig and Ries of the possibilities of rectal examination in labor is one of the most important contributions to modern obstetric medicine of the last generation.

2. There should be a complete revision of the chapter on pelvic examination in obstetric textbooks. Adequate presentation of the value of rectal examination should be made. Vaginal examination should be made subordinate to rectal touch.

3. While at the present time rectal examination does not give us the means of taking pelvic measurements, it is of great value in estimating the factors situated in the posterior half of the bony pelvis.

4. In almost every direction, under appropriate conditions, rectal examination is as definitive as vaginal, if combined with abdominal palpation.

5. The ease or difficulty of rectal examinations are commensurate to the ease or difficulty which encompass the vaginal ones and are dependent on the same factors.

6. Rectal examination is an utterly innocuous procedure in labor; whereas vaginal examinations are always potential sources of infection to the woman.

7. Rectal examinations are peculiarly appropriate to those women who are to receive the test of labor in relatively contracted pelvis when a cesarean section may possibly be needed.

8. Vaginal examinations should be made in labor only when, for some special reason, the rectal findings are indefinite or inconclusive.

9. The least that can be said of rectal examination is that it permits the conduct of normal labor with the essential elimination of vaginal examinations—a decided advance in the technique of the conduct of labor.

EDWARD L. CORNELL.

Edward, M. L.: *Fetal Care: Deduction from the Study of Three Thousand Four Hundred and Sixteen Cases.* *J. Am. M. Ass.*, 1913, lxx, 1336.

The total percentage of stillbirths for the past eight years in the New York Infirmary for Women and Children is 1.6, as compared with 4.29 per cent in the Sloane Hospital and 1.22 per cent in the Universitäts Frauenklinik in Munich (quoted by Holt and Babbitt). The percentage of deaths in the first fourteen days is 1.7, as compared with the 2.1 per cent in the Sloane Hospital. The total mortality of 6.3 per cent is, perhaps, not so much of an improvement over Williams' 7 per cent as the approach to his description of an ideal clinic should warrant. It is, however, a step in the right direction, and the fact that the mortality tends to decrease is encouraging.

MORTALITY STATISTICS FOR THE PAST EIGHT YEARS

Year	Infants born	Stillbirths	Per cent of Births	Deaths First 14 Days	Per cent of Those Born Alive
1905	1,261	5	3.4	9	6.8
1906	1,260	14	4.7	14	3.7
1907	1,111	12	5.3	9	5.6
1908	1,174	13	4	9	2.5
1909	1,113	27	4.9	19	2
1910	1,171	14	2.5	13	3.3
1911	1,081	20	2.3	11	1.9
1912	1,027	11	1.2	15	1
	3,415	126	3.6	50	1.7

The total mortality was 215, or 6.3 per cent.

The causes of the total mortality are: Labor (forceps, 27; craniotomy, 3; rigid cervix, 2; breech, 13, with 2 impacted; long labor, 7; shoulder, 1; early induction, 2; fibroid of cervix, 1; polyp of cervix, 1; flat pelvis with version, 1; placenta previa, 14; prolapsed cord, 12, with 2 pulseless; cord about neck, 6; concealed or accidental hemorrhage 0, 93, or 43 per cent; syphilis 14, or 6.5 per cent; undetermined 18, or 13 per cent; deformity 19, or 8.8 per cent; prematurity and inanition 20, or 9.3 per cent; anaemia, 7; asphyxia, 6; nephritis, 7; atelectasis, 3; cerebral hemorrhage, 4; endocarditis in mother, 3; from other causes, 13.

The other causes were 10 in number and were acute hydramnios, with labor induced 2 (twins); pertussis in mother, 2; typhoid in mother, 1; general infection, 1; intra-uterine infection, 2; intraventricular hemorrhage, 1; meningitis, 1; perisplenitis,

1; hemorrhage into brain, lungs, liver, etc.; 1; infarct of the brain, 1.

Patients register at the infirmary at seven months, sometimes at six months. They make bimonthly visits until the end of the eighth month and weekly visits during the last month. Patients not reporting for a period of a month are delinquent. The patient's history is taken at the first visit, especially as to history of past diseases, former labors or abortions, and health during present pregnancy. The physical examination, unless otherwise indicated, is obstetric only, consisting of external and internal pelvic measurements and abdominal palpation, menses, and auscultation. In making the internal examination, the condition of the cervix and perineum is noted and any erosion of the former is treated.

EDWARD L. CHERRILL.

Manning, J. B.: *Six Cases of Hemorrhage in New-born Babies.* *Arch. Pediatrics*, 1912, xxvii, 825.

In the first case, hemorrhage occurred daily for eight days, beginning with the second day of life. For four days 150 ccm. of serum were given, of which 28 were antistreptococcal and 122 were human blood serum. The serum was quickly absorbed and no infection occurred. On modified cow's milk, together with citrate of iron subcutaneously, three-fourths grain every second day, the infant made a rapid recovery and is in excellent condition today.

In the second case, hemorrhage followed circumcision. It was controlled by blood serum after five days.

In the third case, hemorrhage occurred subcutaneously and intracranially. In spite of active serum treatment the infant died on the seventh day.

In case four, bleeding occurred from scratches on the skin, conjunctiva, and bowels. It was controlled by 10 ccm. horse serum and a teaspoonful of 5 per cent gelatin every hour.

Bleeding occurred per rectum in case five on the fourth day. Horse and human serum controlled it by the fifth day.

In the sixth case, hemorrhage per rectum occurred suddenly on the second day. The infant died in a few hours. A blood culture showed a streptococcal infection.

EDWARD L. CHERRILL.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Oechaner, J. F.: The Interesting History of a Kidney Stone. *N. Orl. M. & S. J.*, 1915, lxviii, 376.

The patient, a woman 55 years old, gave a history of dull pain in the back and right side. On June 10, 1915, she had an attack of terrific pain in the right side, which was relieved by a sedative. During the week following she had two or three attacks of pain of greater or lesser intensity. Urinalysis showed a large quantity of blood. A radiograph taken June 30 showed a foreign body in the right ureter about two inches from its termination in the bladder.

The second radiograph taken July 14 showed apparently the same foreign body in the bladder or at the mouth of the ureter. On July 19 the patient passed the calculus.

DANNA in discussing this paper emphasized the need of caution in the interpretation of X-ray pictures. In one of Danna's cases there was to all appearances a stone in the kidney from the skiagraph. Upon operation, however, none was found. It may have passed between the time of the skiagraph and the operation. In the future Danna intends to have two pictures taken at intervals to verify the first picture, prior to operation.

THOM. DROGOWITZ.

Bryan, R. C.: A Case of Dietl's Crisis in an Anomalous Right Kidney Associated with a Left Pelvic Kidney. *Surg., Gynec. & Obst.*, 1915, xxi, 684.

With the development of pyelography, X-ray, and ureteral catheterization distorted states of the genito-urinary system are now more frequently observed than formerly. Statistics show that one case in 25 shows some deviation from the normal. It is apparently the rather complex embryological development of the urogenital system which is responsible for this reversion. The kidneys start in early uterine life well in the true pelvis so that their ascent superiorly is influenced by many factors. It has also been well established that the anomalous kidney, the fused *nieren-kuchen*, the sigmoid or horseshoe kidney is peculiarly susceptible to a pathological state and morbid reversion. This is no other than the rule of the malignant diathesis in cryptorchismus and hernia of the ovary.

A résumé of the necropsy findings in 18 authentic cases of bilateral ectopy shows the following constant development inhibition:

1. Kidney fixed, densely bound down, flattened.
2. Pelvis usually situated anteriorly.
3. Located about sacro-iliac synchondrosis; i.e., below the pelvic brim.

4. One small single artery, may be as many as six twigs, entering the organ at an abnormal site.

5. Veins multiple, much enlarged, emerging as an angle.

6. Adrenal bodies in their normal subdiaphragmatic locations.

7. Lobulation of the kidney.

8. Hypoplasia of calyces.

9. Ureters are standard but shorter.

Associated with ectopic kidneys any genital anomalies may frequently be observed, such as bicornate uterus, exstrophy, epispadias, etc. Apparently the only condition from which *dystopia renalis* must be differentiated is the fused kidney. The hypertrophic mesentus, excessive peristalsis, capacious confluent pelves by pyelography and mesial location should differentiate the two conditions. Subjective symptoms are notoriously unsatisfactory. Rovsing calls attention to epigastric distress. Neufville calls attention to oedema of the legs. The moth-ball test is of no value; rectal examination should be carried out. X-ray shadows of soft tissues are notoriously misleading; urinalysis is insufficient; cystoscopy with ureteral catheterization and pyelography is the only means at hand for positive diagnosis. The treatment is surgical and if encountered while operating for some other trouble, the organ should not be touched.

Thomas, G. J.: Anuria for Five and One-half Days in a Patient on Whom Left Nephrectomy Had Been Done. *J. Lancet*, 1915, xxxv, 667.

The patient, a man aged 43 years, had nephrectomy of the left kidney done for pyonephrosis at the Mayo Clinic, September, 1911, at which time he was carefully examined, and the right kidney found to be normal. Three months after the operation he returned home in good health.

Two weeks before coming to the clinic the second time (July, 1915) he began to feel bad; lost his appetite; had a coated dry tongue; was constipated, and felt "queer." Six days after the onset it was noted that no urine had been passed for five and one-half days. The bladder was catheterized several times without result. Hot packs, saline, and forced water were used during the next thirty-six hours, and he voided 61 ounces of urine. Suppression was complete for another twenty-four hours. Examination showed the skin muddy in color and very dry; mouth dry; tongue coated, dry and furred; the breath was foul and somewhat urinous; the abdomen was prominent and there was a general tenderness in the abdominal region.

On cystoscopy, the bladder was found to be normal; the right ureteral orifice was easily found, but

no urine was seen during an observation of fifteen minutes. A No. 6 Bute-sed catheter was introduced into the ureter and gentle pressure exerted over the kidney, and a syringe used for suction at the end of the catheter resulted in the passage of about two drams of thick,ropy mucus, followed by a continuous stream of slightly hemorrhagic urine. The cystoscope was removed and the ureteral catheter left in place. By frequent irrigation with warm boric acid solution, the catheter was kept open for three days. Complete recovery resulted.

Röntgen examination was negative. The functional test gave 31 per cent of phenolsulphone-phthalein secreted in two hours.

The points of interest in this case are the following:

1. Complete anuria for five and one-half days, the total amount of urine secreted in nine days being 64 ounces.

2. The patient had but one kidney, the other having been removed some time before for pyonephrosis.

3. There was no history of pain during the present attack.

4. The cause of obstruction was not known. No stones or fragments were passed before or after cystoscopy. Röntgen ray examination was negative.

5. Relief was obtained by permanent ureteral catheter.

6. The patient apparently was in normal health after ten days, and no damage to the kidney demonstrated.

THEO. DROGOWITZ.

Denaclear, C.: Hematuria in Renal Neoplasm. *N. Y. M. J.*, 1915, vol. 1095.

In an interesting article upon renal hematuria, the author has collected 409 case reports of renal neoplasms; hematuria occurred in 146 patients, or in 35.7 per cent. Reports of other authors vary. In 113 case reports of children under ten years of age, hematuria occurred in 37, 18 in boys and 16 in girls, 3 reports not giving the sex. Hematuria occurred from the right kidney in 11 cases and from the left side in 21, the source not being given in 3 cases. As extreme limits, hemorrhage appeared two months before the tumor could be detected, and three months afterward. The hematuria was intermittent in character, only one attack lasting as long as fourteen days. In 4 cases the quantity of blood was considerable.

As no cases were found between the ages of ten and eighteen years, the adult age starts with eighteen. In 263 cases of adult renal neoplasm, hemorrhage occurred in 109 patients, or 64.85 per cent, 74 in men and 36 in women. The sex was not reported in 9 cases. The neoplasm occurred from the right side in 44 patients, from the left side in 47 cases, and from both sides in 3. In 20 patients the source was not reported. Seventy-four patients were between the ages of forty and seventy years. Hematuria appeared early in 40 cases. No other

symptom was present in 23 cases. Malignancy was reported in 31 patients. In 107 cases neither rest nor movement had any influence upon the hemorrhage, while in 7 cases only was it continuous. The amount of blood varied greatly. In the malignant cases, hematuria was present in 75.55 per cent, and in 55.81 per cent of the non-malignant growths.

The diagnosis is sometimes difficult, especially where the presence of blood makes cystoscopy impossible. Pain is seldom absent in renal calculus, while hematuria is not pronounced. The X-ray is indispensable. In renal tuberculosis, guinea-pig inoculations will assist in the diagnosis, besides general physical findings. Pain is slight in renal neoplasms, the pain disappearing with the presence of blood. Loss of weight does not usually occur until the growth is fairly well developed.

Hemorrhage may occur during or following an acute febrile process of the renal gland when cancer is present. If hematuria is present before acute nephritis, the added inflammation increases the hemorrhage. With the loss of blood, the pressure diminishes, and a small amount of urine is excreted. In chronic inflammatory processes, as Bright's disease, hematuria without acute symptoms is almost certain to be a renal neoplasm. Hematuria from a tuberculous kidney is slight, usually following a poor state of health.

In conclusion, hematuria occurs frequently in renal neoplasms, and more frequently in malignant than in non-malignant growths. The hematuria is early in a great many cases, being more common in adults than in children. In many cases blood is present during the entire process, and in quite considerable amounts. An early hematuria in the absence of other symptoms should cause suspicion of renal neoplasm.

C. D. PICKRELL.

Cleveland, A. J.: Transient Hematuria in Children. *Clin. J.*, 1915, xlv, 372.

From the study of a number of cases which have come under his observation, the author draws the conclusion that attacks of transient hematuria occur in children, and that the hemorrhage itself is of no great consequence. This conclusion is based on the fact that careful study and observation eliminated all diseases causing hematuria, also that the hematuria quickly cleared up and there has been no return.

R. F. O'NEIL.

Stanton, W.: Multiple Cystic Kidney. *Buffalo M. J.*, 1915, lxxi, 243.

Stanton reports the case of a female, aged 24, who from childhood had passed large amounts of urine. The patient being apparently in perfect health never consulted a physician. In the summer of 1912 she was suddenly attacked with a violent headache and vomiting, followed by slight stupor. The diagnosis at the time was acute indigestion and she recovered in three weeks. The following year (1913) the patient completed a brilliant college course, having led her class and

having taken an active part in college athletics. In 1914 she married, but was never pregnant. In February, 1915, she suffered an attack of stupor with severe pains in the right lumbar region. Soon after this she consulted the author, who found a trace of albumin, polyuria, and tumor.

Nephrectomy was performed by Dr. W. B. Jones, assisted by the author. A long median anterior incision was made, and upon palpation the right kidney was found to be greatly enlarged; examination of the left kidney showed a similar and almost as bad a condition. All other organs were normal. The abdomen was closed; recovery was uneventful. The patient left the hospital with slight albuminuria and polyuria, voiding 50 to 65 ounces in 24 hours.

Death followed in a month. Autopsy showed that the right kidney weighed 3 lbs. and 14 oz., and measured $7\frac{3}{4} \times 4\frac{1}{4} \times 3\frac{3}{4}$ inches. The left kidney weighed 3 lbs. and 3 oz., and measured $6 \times 4\frac{1}{4} \times 3\frac{3}{4}$ inches.

It is of interest to note that the father of the patient gives a history of polyuria since some years before her birth, and at her death was in an advanced stage of chronic interstitial nephritis.

H. W. E. WALTHER.

Rosebro, B. M.: Pyelitis. *Virg. M. Semi-Month.* 1915, XX, 274.

In discussing the etiology of pyelitis Rosebro emphasizes its occurrence twice as frequently in female infants as in male. In the first six months of life after the second year, girl babies furnish 80 to 90 per cent of the cases. The condition is more frequent at those times of the year in which diarrhoeal conditions occur with greatest frequency; viz., August, September, and October.

Rosebro has observed seven cases in older children associated with and following streptococcal sore throat and the streptococcus was found in the urine.

The prognosis is good, quoting Langstein's report of 90 per cent of recoveries. Most cases are due to the colon bacillus.

J. S. EISENSTADT.

Hendrick, A. C.: Pyelolithotomy in an Unusual Case of Renal Calculi. *Canad. J. M. & S.*, 1915, XXXVIII, 192.

The author reports a case of bilateral calculous disease with the symptoms entirely on the left side. The unusual and interesting point is that the X-ray showed the right kidney to have been entirely destroyed by calculous disease, without any symptoms at all being referable to this kidney at any time. Pyelolithotomy was successfully performed upon the left kidney, a small calculus being removed.

The author makes the following summary:

1. The unusual history of complete destruction of the right kidney without any symptoms.

2. The rather great hypertrophy of the remaining kidney.

3. Of 38 cases of women in the Toronto General Hospital during the last five years, suffering from

the symptoms of renal stone, the following analysis was made:

19 cases were operated upon.

10 had stone in the right kidney.

7 had stone in the left kidney.

1 had stone in both kidneys.

1 had no stone in either kidney. R. F. O'NEIL.

Kilbane, E. F.: Renal Tuberculosis. *Med. & Surg. Report Roosevelt Hosp.*, N. Y., 1915, p. 109.

Kilbane reports 36 cases of renal tuberculosis, in 34 of which nephrectomy was performed, in one nephrotomy on account of the involvement of the other kidney. In another case suprapubic cystotomy and ureteral catheterization showed such extensive involvement of both kidneys as to preclude further surgical interference.

The cases are grouped into three clinical classes as follows:

1. Those presenting the symptom-complex of urinary frequency and urgency, dysuria, loss of weight and strength, pain in the back or kidney region or in the bladder or penis, occasional fever, chills, and sweats, hæmaturia, pyuria, and tubercle bacilli in the urine. This was the most common type, into which 80 per cent of the cases fell.

2. Those in which an acute septic pyonephrosis is superimposed upon a chronic and usually unrecognized pre-existing tubercular pyelonephrosis characterized by a rapidly enlarging kidney tumor with symptoms of systemic infection. Five of the cases, 14 per cent, were of this type.

3. Those cases discovered as the result of routine examinations, the renal lesion not being suspected. Three cases of this type came to operation, attention being directed to the urinary tract by history of hæmaturia, pressure of pus in the urine, passing of calculi, or pain in the back. The cystoscopic examinations were the same in this class: the bladder was normal in appearance, the intravesical portion of the ureter thickened, tortuous, and retracted, pulling the ureteric orifice upward and outward, so that it was higher and further from the median line than the opposite orifice.

As to the age, 62 per cent of the cases were between 15 and 25 years of age, and 75 per cent between 15 and 35 years of age.

Nationality, alcoholism, and family history were of minor consideration as etiological factors. Of the series 3 cases had renal calculi, 6 gave a history of venereal infection, and in 3 of these the symptoms of the gonorrhoeal infection had merged into and continued as symptoms of the tubercular infection.

Previous tubercular lesions are apparently the most important etiological factor. Of 17 giving a positive history of tubercular lesion, only one was located in the lungs; 7 had tubercular epididymitis, and 3 developed it after nephrectomy. Five had either bones or joints affected and in these there were tubercular glands of the neck. Of the symptoms, frequency, urgency, and dysuria were the most constant. Hæmaturia occurred in about 50

per cent. About 66 per cent at some time had pain in the kidney region. There was no elevation of temperature in 21 of the cases while in the hospital preceding operation. The leucocyte count in the majority of chronic cases was within or very nearly within the normal limits.

Tubercle bacilli were found in the urine of 19 cases; in 17 cases they were not found. Of these, 5 were of the second group with symptoms of acute septic infection, and of the 14 remaining, 11 had stenosed ureters. The author feels that the pressure of a stenosed ureter in 68 per cent of cases is of great value in diagnosis, sufficient to justify the diagnosis with very little corroborative evidence, it being assumed that other conditions, ureteral calculi, stricture, etc., are ruled out.

D. L. DENFORD.

Fletcher, F. A.: Renal Tuberculosis; History and Pathology; Symptomatology and Diagnosis; Treatment and Results. *Urol. & Cutan. Rev.*, 1915, 31, 123.

This article is well worth reading, not only by the general practitioner and surgeon, but also by the specialist, though the compliment is paid the urologist of believing that he undoubtedly knows and can employ the knowledge herein contained. The author's ability to review an immense amount of literature and sift from it the chaff is phenomenal. In this short article he practically has given us a mental conception of renal tuberculosis which is invaluable. The mode of infection, the frequency with which it takes place, the post-mortem findings, are so concisely stated that one can instantly fix the percentages in his mind and apply them practically to a case under consideration.

His statements regarding subjective symptoms in the incipient stage of the disease, although reiterating well-known facts, as that pale urine with pyuria and without gross is suggestive of tuberculosis, are so written as to be interesting, though trite. The means of diagnosing, and of making an early diagnosis through the use of the cystoscope, X-ray, and surgery when necessary, is cited, as is also the after-treatment, in a manner to impress upon one that the correct and proper treatment for renal tuberculosis is nephrectomy, but that it is of greatest value when the surgeon possesses the ability to make an early diagnosis.

The factors that have caused the decrease in the mortality rate of nephrectomy are summarized as: (1) improvement in operative technique; (2) cases come earlier; (3) ureteral catheterization and functional kidney tests which bring strongly before us the necessity and possibility of improvement along these various lines.

G. S. PETERLIN.

Crabtree, E. G.: The End-Results of Seventy Cases of Renal Tuberculosis Treated by Nephrectomy. *Surg. Gynec. & Obst.*, 1915, 21, 169.

The author presents data on 70 cases of nephrectomy for renal tuberculosis operated upon by vari-

ous surgeons at the Massachusetts General Hospital. End-results were traced in 50 cases.

Four post-operative deaths are recorded as follows: pneumonia, 1; pyelonephritis of remaining kidney, 1; shock and hemorrhage, 2—an immediate mortality of 3.2 per cent.

Late mortality from tuberculosis subsequent to temporary recovery from operation occurred in 14 cases, or 20 per cent, all within five years. Of these, 4 died from tuberculous cachexia, 2 from tuberculous meningitis, 3 from "tuberculosis" (form not recorded), and 3 from genito-urinary involvement. In this connection it is of interest to note that genital involvement occurred in 17 per cent of all male cases, whereas none of the females were so affected.

Sixty per cent of the series were considered cured, although in 35 per cent there remained legacies of the disease, such as nephritis probably of toxic origin and secondary infections of the remaining kidney; irritable bladder, sometimes due to cicatrices; traces of albumin and slight pyuria. Nine cases, or 12.8 per cent, were unimproved.

Finding that young individuals with early lesions of the kidney, which usually show considerable cortical tuberculosis and perinephritis do not do so well after nephrectomy as those of more advanced age, but in whom the disease is often more extensive, the author raises the question of artificial immunization in these individuals.

In concluding, the author states that the results for this series of drainage of the wound after nephrectomy compare favorably with undrained wounds in recent cases in regard to sinus formation. There are 25 per cent which heal by first intention and 75 per cent in which sinuses develop, irrespective of the method of wound closure employed. In undrained wounds sinus development is late and, where the follow-up system is not carried out, may give a false idea as to the value of the treatment.

Shropshire, C. W., and Watterson, G.: Kidney Lesions Diagnosed with the Aid of the Cystoscope and X-Ray. *Lancet-Chin.*, 1915, 21, 571.

The authors call attention to the errors in the diagnosis of kidney lesions due to failure in employing exact methods of diagnosis. Two personal cases are reported to illustrate the value of urologic methods of diagnosis. These patients had suffered for years because the usual methods of examination had failed to reveal the real nature of the trouble.

From a careful study of their work the authors reach the following conclusions:

1. Combined cystoscopic and X-ray examination is of the greatest value in the diagnosis of lesions of the kidney and ureter.

2. Practically all errors are avoidable if use is made of the means at command for reliable diagnosis.

3. Patients who have symptoms of lesions of the kidney are usually treated by the internist and surgeon for a period of several years before a diagnosis is made.

4. The term pelvic retention is more appropriate than hydronephrosis.

5. A pelvis which because of its position favors retention is sure to become infected, for stasis in any part of the body is sure to be followed by infection.

H. A. FOWLER.

Allen, E. S.: Surgical Kidney; Report of Five Cases. *Urol. & Gynec. Rev.*, 1913, xix, 669.

The point is emphasized that in very many cases patients with infection of the kidney are treated for long periods of time for other conditions. These patients usually have irregular chills, fever, and other symptoms simulating typhoid, malaria, or rheumatic infection. During the last year at least 75 patients have been brought to the laboratory for blood examination because of suspected typhoid fever or malaria where microscopic examination of the urine has demonstrated renal infection. Two of the five cases reported had had prolonged treatment for malaria as a result of mistaken diagnoses, the trouble having been pyonephrosis, one complicating calculus.

S. W. MOOREHEAD.

Quinby, W. C.: The Management of Pneumothorax Occurring as a Complication of Nephrectomy. *J. Am. M. Ass.*, 1915, lvi, 2154.

The accidental opening of the pleural cavity during nephrectomy is, as Quinby points out, an unavoidable complication. Such injury to the diaphragm may occur even under the most expert operator and with the most skillful dissection. It may even occur during subcapsular nephrectomies. It is in cases in which the perirenal tissue has been greatly infiltrated with inflammatory products that the accident is most apt to occur. Dense adhesions are most common to the left side owing to the fact that the left kidney is the higher of the two. It occurs most frequently at the upper angle of the lumbar wound.

Incision of the pleura may also occur in the presence of a rudimentary twelfth rib, in which case the operator may overlook this rib altogether, and call the eleventh the twelfth. Such a mistake can be avoided by examining the ribs before operation.

While it is true that the pneumothorax caused in the manner referred to is usually small in amount and devoid of any special dangers, except of possible infection, this may not be the case in each instance. Severe functional disturbances may follow pneumothorax.

Whether the tear be large or small, Quinby believes that conditions within the thorax should be restored to normal at as early a moment as possible. Should the lesion in the thorax be a large one, a sponge forceps should be pushed into the chest and made to grasp the collapsed lung. By making steady traction the mediastinum can be supported and the uninvolved lung given a chance to carry on respiration until the tear can be closed. Small tears should be closed as discovered.

If symptoms of insufficient ventilation persist,

the air in the chest should be removed by aspiration. This is best done by puncture with a trocar low on the side in the midaxillary line of the thorax.

H. W. E. WALTER.

Schmidt, L. E.: Nephrectomy During Pregnancy. *Surg., Gynec. & Obst.*, 1915, xvi, 679.

The author gives the history of one case of nephrectomy in the fifth month of pregnancy in a multipara, aged 28, who suffered from chills, fever, frequent and painful urination, and progressive loss of flesh. A diagnosis of tuberculosis of the left kidney was made prior to operation. The kidney together with fatty capsule and the ureter were removed *en masse*. The patient recovered and was delivered at term, but the child died of sepsis on the twelfth day.

Brief histories of 35 additional cases are given from which it is shown that the mortality to the mother is 5.7 per cent. In 77 per cent of the cases the mothers had normal labors at term. In 15 per cent harmful effects on the fetus were observed. The author believes that a previous nephrectomy is no contra-indication to marriage provided the remaining kidney has been shown to be sound for years. During pregnancy a nephrectomy threatens the life of the mother in proportion to the gravity of the case, the danger of eclampsia, and the involvement of the other kidney. The risk to the child varies with the condition of the mother and the dangers incident to induced or natural abortions and induced labor.

Geraghty, J. T.: Consideration of Renal Function Tests. *Indianapolis M. J.*, 1915, xviii, 141.

It is now recognized that the functional power of the kidney is only roughly proportionate to the degree of anatomical change. The value of any excretory test is therefore purely empirical and indicates the functional capacity of the kidney at the time at which the test is performed. By themselves the tests do not make a diagnosis or settle the prognosis, which must be determined from a knowledge of the underlying pathological process producing the reduced function. Functional studies reveal only the excretory capacity.

It is unnecessary to use all of the large number of functional renal studies, since the information to be gained by their use is available at times from a single test or from the proper combination of a small number of tests.

The author and his co-workers cannot support the studies of Schlayer in his attempts to differentiate between tubular and glomerular involvement. Schlayer determines tubular function by the ability of the kidney to excrete salt and potassium iodide, and glomerular function by the ability to excrete water and lactose. Animal experiments have conclusively demonstrated that lactose may be excreted by the tubules, and Geraghty's studies lead to the conclusion that the potassium iodide test, as used by Schlayer, is unreliable.

The application of functional tests in association with ureteral catheterization has become extremely valuable. Phthalein is superior to all other tests in that it indicates absolutely, as well as relatively, functional values, pointing out not only which is the diseased or more diseased of the two kidneys, but giving a positive indication of the amount of work which each kidney is doing relative to its fellow, and, what is of more importance, the amount of work of each relative to the normal. This gives a much better prognosis concerning the capacity of the remaining kidney to carry on renal function than any other test. With respect to total renal function, the phthalein test is incomparable. All results obtained upon ureteral catheterization must be controlled with respect to unilateral inhibition and error from leakage about either catheter. In case of bilateral disease a knowledge of renal function becomes of absolute vital importance. The phthalein test enables one to recognize infantile kidneys and to differentiate pyelitis from pyonephrosis.

In conjunction with the phthalein test, blood urea, a test of retention is extremely valuable in cases where the total phthalein output is reduced. When the phthalein excretion is normal, or nearly normal, it will always be found that there is no retention of urea in the blood. But in bilateral disease of the kidney in which phthalein is reduced, the estimation of blood urea has a considerable diagnostic and prognostic value. In severe grades of renal insufficiency the amount of retention of urea may reach as high as two or three grains per liter, and a blood urea of seven grams has been reported. The estimation of the blood urea is particularly important when for some reason it is impossible to obtain urine for estimating the quantity of phthalein excreted. FRANK HINMAN.

BLADDER, URETHRA, AND PENIS

Bennett, V. B.: Notes on the Treatment of Vesical Calculus. *Indian M. Gaz.*, 1915, I, 401.

The author reports his experience in the treatment of 3,004 cases of vesical calculus. This unusually large number of cases were operated upon during a period of seven and one-half years.

The mortality in the litholapaxy cases was one per cent. The author believes that this one per cent mortality might be avoided by a careful selection of the cases. During one year 472 cases were operated upon with only one death.

The author makes the general statement that about 3 per cent of all stone cases call for treatment by the suprapubic operation. In determining whether a patient should be subjected to the suprapubic operation or to litholapaxy, the size and condition of the stone are not so important as the condition of the heart and kidneys. Cases with damaged heart and kidneys stand anesthetics poorly. They are the cases that swell the mor-

tality of litholapaxy and call for suprapubic operation. The value of the subsequent bladder drainage acts very beneficially in these cases.

In frail old men, with a weak, slow pulse, without signs of tension and with small stones, the use of a local anesthetic often prevents a death from litholapaxy.

H. L. KRAMER.

Roberts, W. O.: Hernia of the Bladder. *Urol. & Gynec. Rev.*, 1915, xii, 505.

Hernia of the bladder, although of not very frequent occurrence, was known to the ancients, having been described in the eleventh century. The author states that up to 1896 not more than 300 cases had been reported. In 1908 the number increased to approximately 300. He does not believe that there is actually an increase in the number of these cases. This apparent increase is due to the fact that a greater number of herniotomies are being performed now than formerly and that the Bassini technique permits a more thorough exposure.

Anatomically there are recognized three types of vesical hernia: (1) the extraperitoneal, in which a portion of the viscus protrudes alongside the sac of an ordinary hernia, or rarely, independent of any hernial sac; (2) the intraperitoneal, in which a portion of the viscus appears in the sac covered with peritoneum; and (3) the paraperitoneal, in which a portion of the viscus only is covered with peritoneum of the sac.

According to the author, the primary and essential etiological factor of vesical extrusion complicating hernia is difficult to understand, unless the doubtful hypothesis be accepted that there exists an acquired weakness of the muscularia, or congenital defective anatomic conformation, rendering such extrusion possible. The extreme rarity of vesical impaction in infantile hernia militates against its congenital origin, few examples having been recorded as occurring during childhood.

Displacement of the viscus by a markedly distended rectum in obstipation may be a predisposing factor. Other presumed contributing causes are laxity of the muscularia, external or internal violence, overexertion, traction from vesical, omental, and intestinal adhesions.

As definitely characteristic symptoms seldom occur, accurate ante-operative diagnosis of vesical extrusion complicating hernia is usually impracticable.

In some instances vesical extrusion occurs secondarily; i.e., where hernia recurs after primary operation. Under such circumstances, as it is more than likely that the sac contains only the urinary bladder, the diagnosis should not be difficult.

Even during the performance of herniotomy the diagnosis of complicating vesical extrusion is not always easy of accomplishment; the viscus may be mistaken for the intestine, and the prevesical fat may closely resemble the omentum.

In a large proportion of the recorded examples

the viscus remained unrecognized until inadvertently incised during operation.

Vesical extrusion may be suspected if the hernial sac contains an unusual quantity of fat, if definite muscle fibers are recognized, or if difficulty is encountered in locating the neck of the true hernial sac.

H. L. KRETSCHMER.

Morton, H. H.: Carcinoma of the Bladder. *Pacific M. J.*, 1915, lvm, 752.

All attempts at operative treatment of cancer of the bladder have been discouraging, as very often the disease has been spread or the suprapubic wound has failed to close.

According to European clinicians the bladder should be opened only in:

1. Neoplasms involving the dome or front.
2. Budding neoplasms whose offshoots clog the neck of the bladder like a stopper in a bottle and cause retention of urine.
3. Neoplasms causing hæmaturia where hæmorrhage makes intervention necessary.

When the tumor involves the floor or is around the ureteral orifice it is better to leave it alone. Removal of the tumor and resection of the bladder wall for one inch around the base promises to be of some benefit in bladder cancer provided it is done early.

The general practitioner should bear in mind that every case of hæmaturia demands an immediate cystoscopic examination, and if the hæmaturia is caused by bladder cancer, early diagnosis with prompt removal affords at least a possibility of saving the patient's life.

H. A. MOORE.

O'Neill, R. F.: Bladder Tumors in the Young. *Boston M. & S. J.*, 1915, clxxiii, 873.

In relation to that of other tumors the occurrence of vesical neoplasms has been variously estimated as 0.30 to 0.75 per cent. In 262 bladder cases Albarin found but 6 tumors occurring from 1 to 10 years of age, 3 from 10 to 20, and 16 from 20 to 30. In the Massachusetts General Hospital from 1870 to 1915, among 62 bladder tumors only one occurred in a patient under 20 years of age. The tumors of the young are typically of connective-tissue derivation, as contrasted with the epithelial derivation of the majority of tumors found in adults. Sarcomatous degeneration is very common; a fatal outcome is the rule. It is usual to find the tumor springing from the region of the trigonum. As they do not bleed with the facility of the epithelial tumors of adults, interference with urination is commonly the initial symptom, and a mistaken diagnosis of stone is frequently made. Extrusion of all or a part of the tumor through the urethra has been observed several times in female children.

Heretofore a diagnosis has rarely been made until an extensive growth was present, and treatment, whether by the suprapubic, perineal, or periurethral (in females) route has been futile in most cases.

S. W. MOORHEAD.

Morton, H. H.: Stricture of the Urethra. *Med Times*, 1915, xliii, 134.

The author continues his subject by taking up the treatment of strictures which are not operable. There are two causes of stricture: the most common is gonorrhœa, the other, traumatism causing rupture of the urethra.

The importance of the clinical distinction between the two varieties of stricture—the soft and recent, and the hard and organized—is pointed out. Every stricture in the beginning is due to soft, round-celled infiltration, which in this stage yields to treatment by sounds; afterwards fibrous tissue forms, frequently necessitating operation.

Three forms of stricture are met with: the linear stricture, which is a fine line; the annular stricture, which is a broader line surrounding the urethra; and the tortuous or innodular stricture, which is a heavy mass of scar tissue which cannot be brought to absorption.

As to number, the gonorrhœal are usually multiple, while the traumatic are usually single at the site of rupture.

The favorite locations for stricture are the pendulous and the bulbomembranous urethra.

Important changes take place behind the stricture. A pouch is formed by the distention of the urethra, which retains a drop of urine; this decomposes, irritates the mucous membranes and causes a gleet discharge. Prolonged inflammation leads to ulceration, which if small forms an abscess, opens externally, and leads to fistula; if large, to extravasation of urine. The walls of the bladder hypertrophy and the muscular fibers lose their elasticity, which is followed by atony. The urine accumulates, decomposes, and sets up a cystitis. Back pressure on the kidneys leads to dilatation of the ureters and pelvis of the kidney. Infection follows and pyelitis or pyelonephritis develops and death ensues.

The author designates the most constant symptoms as: frequency of urination; dribbling after urination; distorted and smaller stream; gleet discharge from the meatus and shreds in the urine; retention of urine; impotence with feeble erection or premature ejaculation. Pain in the urethra is an inconstant symptom.

He advocates the use of the flexible bulbous bougie in making a diagnosis, on the ground that a sound, passing through a stricture, gradually dilates it, and if it will go into the bladder passes through without giving any perception of being arrested; whereas, the flexible bulbous bougie on being withdrawn from the bladder catches and gives the sensation of being caught against a fiddle string.

In the treatment of soft and recent strictures, steel sounds and dilators are used. Sounds should not be passed oftener than once in five days, and when the stricture has been dilated to the full size of the sound, dilators should be substituted, being used once a week and followed by an irrigation of nitrate of silver. The author urges care in the use of

these instruments, as otherwise much damage may be done.

The matter of very tight strictures is then taken up and methods for their treatment discussed; namely, gradual dilatation with tunnelled sounds (coated with the whalebone guide to avoid making a false passage) up to a point where other sounds can be used, and substitute dilators, or, in cases of very dense, tortuous stricture, immediate operation by external or internal urethrotomy. F. R. O'NEIL.

Mark, E. G., and McCarthy, H. E.: A Case of Varices of the Male Urethra. *J. Am. Med. Ass.*, 1912, LV, 1002.

The authors report the following case, which is of interest because of its rarity.

The patient, a male, aged 46, with negative past history, while lifting a heavy box onto a train felt sudden pain in the region of the urinary bladder, followed by a desire to urinate. He voided urine, but as the act was performed in the dark, he does not know whether any blood was passed. A few minutes later he noticed his clothing in the neighborhood of the genitals was damp, and on investigation found it quite bloody. He urinated five or six times during the night following without pain; he noticed clotted blood at first followed by clear urine and then pure blood. The hemorrhage from the urethra continued.

At examination his hemoglobin was found to be 70. General examination revealed nothing of note. Clots were present at the external meatus and stripping of the urethra provided active bleeding. A dose of 10 ccm. of normal horse serum was given. Cystoscopy revealed negative bladder and posterior urethra. However, urethroscopy in the region of the perineal junction on the roof of the urethra disclosed a peculiar appearance. An irregular, soft mass of a reddish black color was seen projecting into the canal as a distinct tumor. On close examination it was seen to be a small tear in the mucosa. The point of rupture was the seat of the hemorrhage. The authors conclude that this was a case of venous aneurysm. H. W. E. WALTER.

GENITAL ORGANS

Whiteford, C. H.: A Case of Failure of Union Between the Vas Deferens and the Testis. *Edinb. M. J.*, 1912, IV, 400.

The case is briefly reported as follows: The patient, aged 23, was admitted for operation for right inguinal hernia, present since birth. The right testis was undescended. The left testis was normal. At operation the right testis was found high up in the canal. It was one-half the size of its fellow and well formed except that the epididymis was ill-developed and had a well-marked mesentery. High up behind, and adherent to, the posterior wall of the sac a vas of normal size was found emerging from the internal ring. The vas was coiled and tapered away to a small nodule which on section proved to

be the epididymis. This nodule was adherent to the sac wall and had no connection with the testis.

H. A. FOWLER.

Huber, F.: Prostatic Calculus. *N. Y. M. J.*, 1912, CII, 641.

Six cases were met with by Jacobi in 48 autopsies, death resulting from various causes. Small renal calculi are very common in infancy (Heit). The calculi are found generally in the region of the papilla from which they migrate, their migration being attended with violent spasmodic pain, erections, dysuria, and even convulsions, with marked relief on urination. Impaction at one of the normal anatomical constrictions, bulb, perineal, angle, meatus, is not uncommon (Dugan), at times leading to extravasation. The calculi are composed of oxalate of lime, uric acid and its salts, phosphates, rarely cystin, xanthin, and indigo.

The author reports the case of a boy of five with frequent and imperative urination. Later complaint was made of severe pains referred to the head of the penis, with more distress on micturition. No symptoms of infection were evident except a few pus-cells in an otherwise normal urine. A condition of incontinence from overdistention ensued, which was somewhat relieved by the patient assuming the Trendelenburg position. The presence of stone was determined by a Little searcher. Radiography demonstrated a single shadow in the region of the prostate. The stone was removed by perineal lithotomy with retention catheter for a few days. Recovery was unevenful. The calculus measured 15 x 11 x 18 mm. and was composed of cystin. Eight months later another attack of acute retention occurred which was relieved by use of the catheter. The urine showed albumin and pus, and a searcher located a second stone in the region of the prostate. This was removed by external urethrotomy and resembled the first. This stone was not revealed by previous radiography although the right kidney was tender on examination.

Studies in cystin metabolism are unsatisfactory. It is held to be some perverted protein metabolism, and cystinuria seems to display no symptoms but calculi. Cystinuria is uncommon, 4 cases occurring in 3,500 urine examinations, one with symptoms of calculi (Sondern), and only 170 cases of calculi as yet reported (Neumann). Brinkner recommends for the differentiation of prostatic and renal calculi, radiography in the prone and Trendelenburg position to determine whether the resulting shadows are in fixed relationship with other fixed parts or not, a bladder calculus in this region being movable; also absence of local symptoms of infection over a long period of time, as is the case with purulent prostatitis.

L. L. FEE RANNEY.

Joly, J. S.: Prostatic Obstruction and Its Sequelae. *Practitioner, Lond.*, 1912, XCV, 763.

The author reviews in detail the course of a hypothetical uncomplicated case of prostatic obstruction.

tion and shows how it becomes altered by the advent of complications.

He advises operation as soon as definite signs of prostatic obstruction are discovered. Operation is not an alternative to catheterization; it is a cure of the condition, and therefore should never be delayed. Catheter life is a makeshift, and a dangerous one at that. Prostatectomy is the only certain cure. The indications for operation may be summed up briefly — every case of obstruction due to the senile enlarged prostate should be operated upon. He makes the following suggestions:

1. All patients with two or more ounces of residual urine should be operated upon.
2. Patients with less than two ounces of residual urine should be operated on if (1) the other signs of prostatic obstruction are marked, or (2) if there have been attacks of retention. These suggestions presuppose that the diagnosis of the prostatic condition has been made without any possibility of doubt. The mortality after prostatectomy is about 7 per cent, and over 60 per cent of this is due to delay. The contra-indications to this operation are not so numerous as might be expected at first sight, for many of the so-called contra-indications have little or no weight.

LOUIS GROSS.

Fullerton, A.: Some Points in Diagnosis and Treatment of Enlarged Prostate. *Med. Press & Circ.*, 1913, 6, 254.

The author describes the position and relations of the gland and emphasizes the relations of venous plexi. He also emphasizes the division made by ejaculatory ducts which mark off an upper and lower portion and that enlargement is quite predominantly above these structures. This relationship is also of importance in that injury predisposes to epididymitis as a sequela of operation. Enlargement therefore is generally upward displacing of the ejaculatory ducts raising the floor of the bladder, and frequently the gland insinuates itself between fibers of sphincter muscle which leave their mark on the enlarged gland. There is, therefore, an elongated prostatic urethra with alterations in cross section and the normal angulation of its upper and lower portions necessitating the common curved prostatic catheters.

Three types of enlarged prostate are met with: (1) Adenomatous, the most common, in which enucleation frequently consists in merely shelling out adenoma, the gland having been compressed into the form of a sheath for the same. (2) Fibrous, in which the gland is small, but irregularities in its outlines frequently present marked urinary obstructions. This type is removed with difficulty and generally with injury to contiguous parts. (3) Carcinomatous, which according to Young is the case with one out of five; according to other authors one out of seven or ten.

As to etiology some of the most common factors are family predisposition, senility (rare under fifty years); the influence of city life (where it is twice as

frequent as in the country) (alcohol and sedentary life); marriage (80 per cent being married men).

There is no connection with arteriosclerosis or gonorrhoea. One-third of those examined in routine are thus afflicted and in only one-half of these are symptoms present (Wilson and Magrath). Cystoscopy reveals the enlarged lobes and altered neck of the bladder or perhaps the changes in the bladder wall due to obstruction (trabeculae, diverticulum). Dilatation of the ureteral orifices, not uncommon at autopsy, is rarely observed at cystoscopy. Kidneys show interstitial changes commonly provoked by increase of back pressure and later the usual changes of purulent conditions.

The first symptom is frequent micturition, especially at night. Soon one notices a hesitancy. Exposure, the use of alcohol, or prolonged sitting, as in a car, are apt to produce a more or less acute exacerbation of these symptoms. Acute retention frequently occurs and is manifest by incontinence. Soon the characteristic urinous odor develops. Haemorrhage, haemorrhoids, and hernia from overstrain may develop. Signs of sepsis are late and have serious manifestations. Residual urine is found after catheterization. Retention may give rise to bowel symptoms resembling tenesmus and suggesting carcinoma of the bowel.

L. L. TEN BROEK.

Descuns, M.: A Case of Sarcoma of the Prostate. *Am. J. Urol.*, 1915, xi, 375.

The author reports the case of a boy, 14 years old, who had been well up to June last, but noticed at that time that micturition became more frequent. This symptom continued and even increased in severity until one day after a long bicycle ride the patient could not urinate. This was August 15, and a physician who was summoned had considerable difficulty in passing a soft catheter. On the day following, this operation had to be repeated. Up to this time the urine had been clear and an analysis done on several occasions had always been negative. Later, however, the urine, by catheter, was seen to be cloudy and purulent.

When Descuns first saw the patient in October he was pale and thin and walked with considerable difficulty. When lying on his back and the abdomen freely exposed to view, by palpation a tumor could be discerned occupying the hypogastric region up to the umbilicus. It gave the impression of a distended bladder. A catheter was passed and 600 gr. of distinctly purulent urine was withdrawn. The hypogastric tumor was found to have subsided to a certain extent, but had not completely disappeared. It reached the middle of the pubic-umbilical space and was particularly perceptible on the left side where it seemed to encroach upon the iliac fossa. It appeared to be quite hard, regular in outline with a smooth surface, and painless.

Hydatid cyst of the small pelvis was suspected and October 6, a laparotomy was done and the upper pole of the tumor revealed. The surface of the

growth appeared fibrous, regular, and hard, and believing that the diagnosis was correct a trocar was thrust into the growth, but as no fluid came away the instrument was withdrawn and another puncture made—with the same result. It now appeared that the tumor developed from the walls of the small pelvis or the prostate. The capsule of the tumor was incised and yellowish tissue distinctly lipomatous disclosed, which, with the finger, could be easily detached from its capsule. Enucleation was carried out, difficulty being encountered only when the bottom of Douglas' cul-de-sac was reached. A large drain was introduced and the cavity of the tumor packed with gauze. The operation lasted only 45 minutes. Two hundred grams of salt solution was given during the day. The evening temperature was 37.2° C., pulse 90. The patient died on the night of the fourth day, apparently from shock.

Microscopical section of the tumor showed that it was a large round cell myxosarcoma.

DESCUDES' conclusions are: (1) Sarcoma of the prostate is an infrequent disease and usually occurs in young people; (2) it makes itself manifest by an attack of retention of urine and by disturbances in defecation; (3) The prostate presents hypertrophy and varies in consistency; (4) Prostatic carcinoma should not be mistaken for sarcoma of the bladder, hydatid cyst of the pelvis, abscess of the perineum, and above all for hypertrophy or cancer of the prostate; (5) In children the treatment should be purely symptomatic. In adults, if seen early, prostatectomy should be attempted.

H. W. E. WALTHER.

Cunningham, J. H., Jr.: Cysts of the Prostate. *Surf., Gynec. & Obst.*, 1915, xii, 609.

Cysts of the prostate are rare, and are of three classes: (1) retention cysts, dependent upon obstruction of the prostate ducts with retention of secretions; (2) cystic dilatation of the remnant of Mueller's duct, which is the homologue of the vesicula prostatica or sinus pocularis; and (3) echinococcus cysts.

The first class, retention cysts, is the most common, and the cysts are probably congenital in origin, they having been observed in the newborn. There are but 15 recorded cases. The cysts have been observed to vary in size from that of a pea to that of a large grape. They usually project into the prostatic urethra, being covered by a thin layer of mucous membrane, but less commonly they project into the bladder near the vesicle sphincter, and have only been recognized ante-mortem in 4 cases.

The second class, cystic dilatation of the sinus pocularis, is the rarest form of prostatic cysts, but 6 cases being recorded. The case reported by the author is the largest cyst on record, it was the size of a lemon. But one case was diagnosed prior to operation, one at the time of operation, and the remaining cases were post-mortem observations.

The third class, echinococcus cysts, may or may

not be primary in the prostate, there being much debate upon the point. As such cysts involving the prostate have in most instances been associated with similar cysts elsewhere in the body, the weight of evidence seems to favor the view that the prostate is secondarily involved from such cysts located in the pouch of Douglas.

Subjectively, the symptoms are those of prostatic obstruction or of sexual disturbances associated with the ejaculating of semen. Objectively, the prostate is found enlarged by rectal examination and there is an associated residual urine.

The diagnosis must depend chiefly upon the urethroscopic and cystoscopic findings.

The treatment of retention cysts is best conducted through the urethroscope when in the urethra; and by the suprapubic route when in the bladder. Cysts of the sinus pocularis should be attached through the perineum when large and through the ureteroscope if small. Echinococcus cysts involving the prostate and producing the symptom of prostatism have been successfully dealt with by the perineal and suprapubic approach, either destroying the cysts by excision and drainage, with, or without, the removal of the prostate.

The original article gives a summary of all the recorded cases and a complete bibliography.

Lowale, O. S.: The Prostate Gland in Old Age. *Ann. Surg.*, Phila., 1915, lxx, 716.

Lowale, in a voluminous article, admirably describes the anatomic evolution of the prostate from embryo to old age. Of the aged, his observations cover 71 specimens from patients varying from 62 to 79 years of age. This observation includes gross specimens, and complete serial sections of the entire organ as well as sections of the sphincter and trigonum vesicæ.

Embryologically the prostate is divided into five independent groups of tubules which begin development about the twelfth week *intra-utero*. The old nomenclature (anterior, middle, posterior, and two lateral) is given. The posterior lobe arises independently from twelve tubules from the floor of the prostatic urethra below the ejaculatory duct orifices. Should the middle lobe tubules be absent an ingrowth of the lateral lobe tubules occurs. The anterior lobe is large at the sixteenth intra-uterine week and quite small at birth. Seminal vesicles appear (thirteenth week) as lateral buds from the vas deferens. The growth of the ejaculatory ducts push up the mucosa making the verumontanum, the utricle extending to the base of the prostate till after the fifth month. The early embryonic peritoneal covering posteriorly over the seminal vesicles and prostate to its apex is shown pinched off, thus forming the fascia of Denonvilliers.

The prostate while cylindrical in embryo becomes a truncated cone in the adult, its length always being greater than its thickness and less than its width. At the twenty-fifth year full development

occurs. Lowsley differs from Cuthbert Wallace regarding scanty glandular elements at eighteen years. In his opinion the increase is rather gradual from birth until puberty at which time the increase is tremendous. During the fifth and sixth decades hypertrophy is the most likely to occur. Thirty per cent of males over sixty years of age show adenomatous enlargement.

Cross-section of the prostate shows that the gland is composed of concentric layers of tissue, the central area containing the urethra, ejaculatory ducts, veru, and utricle. In the next layer the muscle-fibers are found, especially around the ducts where two layers occur. The outermost or cortical layer contains practically all of the posterior and lateral lobe tubules; the middle and anterior lobe tubules coming from the deeper lamina. Islands of lymphoid tissue occur in the prostate following puberty.

He substantiates Versari's claim that the sphincter vesicæ is a structure by itself, developing independently. The only non-capsulated portion of the gland occurs at the base for ejaculatory duct passage. The breech necessitates an extra connective tissue and muscular covering for the middle lobe tubules. The posterior lobe, which is the portion of gland felt per rectum, is described as fairly well separated, being divided off by a thick connective-tissue partition, its roof acting as a floor for the ejaculatory ducts. By severing the verumontanum connection from the ducts, he contends that it is then possible to enucleate without disturbing the ejaculatory ducts.

In quoting older writers' descriptions of the prostate, Ruedinger says that "no other viscus incloses within itself so great a number of muscular fibers in such a limited area."

The tubular condition of a seventy-six year old prostate he compares favorably with a normal one with the exception of atrophic changes, while the glandular change, in the majority, is hypertrophic.

On account of a valvelike lapet of tissue that prevents urine contamination possibilities, Lowsley thinks that none but pathologic or contaminated openings of the prostatic ducts are seen with cystourethroscopy. A count in 12 cases, following the various tubules out, gave an average of 58 prostatic duct openings.

He sustains himself from his investigations in 447 cases in the opinion that the middle lobe of the prostate is not a glandular outgrowth from the lateral lobes, by quoting Griffith, Tandler, and Zuckerkandl.

Under the head of "accessory organs," Delbert is quoted as declaring that the trigonum vesicæ is an appendage of the ureteral walls. Its superposition is claimed by Lieuland and its dissection entirely free from the bladder wall done by Mall.

The claim is made that 25 per cent of all cases over thirty years of age have hypertrophy of Albarra's glandular group. This enlargement is frequently confounded with middle-lobe enlargement, which condition, however, is extremely rare.

The completeness of the seminal vesicle fascia is referred to as a protection from carcinoma. Enlargement occurs in 31 per cent of males over twenty years old, the right enlarging three times as often as the left.

The valvelike openings of the ejaculatory ducts, when infected, gap open thus inviting duct infection, vesiculitis, vasitis, and epididymitis. In no instance did the ejaculatory ducts open into the utricle but always into the lateral walls of the verumontanum. A case is cited where hypertrophic tissue bands from the verumontanum produced urethral block.

Twelve small tubules, sparingly muscularized, surrounding the urethra at the apex and extending down to the membranous urethra, are designated the apex group.

The venous circulation of the prostate is given as the most extensive anteriorly and laterally where the plexus of Santorini is formed from the dorsalis penis vein. The plexus is intercommunicating with veins from the seminal vesicles, bladder, and rectum. Phleboliths frequently occupy these veins. The lymphatics surround the glandular acini, then pass out to a plexus beneath the capsule, here collecting tubules occur, especially from the post-glandular region. Communication is then made to the internal and external iliac, lateral sacral glands, and to a gland on the internal pudic. C. E. BARNETT.

Whiteside, G. S.: Prostatectomy Mistakes and Failures. *J. Am. M. Ass.*, 1915, lxx, 1163.

The author compiles from a questionnaire and from his own work a number of conclusions based on a total of 1,423 cases of prostatectomy.

In the way of faulty diagnosis, stricture, spinal neuroses, kidney lesions, and many other conditions have been overlooked in the examinations. Cancer is inevitably not diagnosed at times even by most careful men.

In the series there were 14 cases of rectal fistula and 24 of post-operative incontinence — all in perineal operations.

Two cases of fatal hæmorrhage occurred from the passage of a rectal tube the day following suprapubic enucleation.

Vesical diverticula (unrecognized) were responsible for residual urine following the operation in several cases.

Whiteside quotes a number of individual opinions as to unusual complications. He argues for deliberation in the preparation of these cases. Many will survive such operations who would die if hurried into the operating room with little preliminary treatment. FRED R. CHARLTON.

Barnett, C. E.: When Is a Prostatic Fit for Operative Procedure? *Urol. & Colon. Rev.*, 1915, xix, 673.

The author emphasizes the importance of preparation before prostatectomy. He reports a case of a patient who died after suprapubic cystotomy.

He reviews the ordinary findings in prostatics when they first enter the hospital for treatment, and describes his methods for relieving the conditions which are not normal. He believes that prostatectomy is a much more serious operation than is usually supposed and should be done by surgeons who recognize the importance of pre-operative treatment. In one of his patients with acute retention that could not be catheterized, suprapubic cystostomy was done under general anesthesia and a suprapubic drainage tube put in place. The patient's chances for recovery were apparently good, but he died on the third day from so-called uræmia, but the author thinks it may have been the effects of the general anesthetic, coupled with the absorption of the toxic material from the floor of the bladder due to relaxation from sudden emptying of the bladder. Since this experience the author has always used a local anesthetic for suprapubic cystostomies. He believes that if this patient had had preliminary treatment he would not have died. The usual findings of the prostatic, on entering the hospital, in the author's experience, aside from the hypertrophy, are:

1. Residual urine—4 to 60 ounces—which is usually markedly acid or alkaline and of low specific gravity (1010 to 1014).
2. Kidney functional test low—10 to 30 per cent phthalein.
3. Scanty secretion—20 ounces.
4. Polyuria—60 to 100 ounces.
5. Colitis with gas distention of the bowels.
6. Constipation or diarrhoea.

Arteriosclerosis may or may not be present with pulmonary oedema because of kidney-block. The author believes this pathology must be overcome, first by drainage of the bladder, preferably by the suprapubic method. After this the lesser of the body faults may be corrected according to their findings. The author's method for relieving acidity and alkalinity of the urine are given. He believes that infection is rather an advantage than a disadvantage; most patients with stones that already have infection are immunized and seem to recover without complications.

In carrying out pre-operative treatment Barnett thinks that a special nurse is absolutely necessary. A patient is not fit for prostatectomy, in his opinion, when the specific gravity is below 1016 and the functional test is low (when phthalein is below 50 per cent and when the second hour percentage exceeds the first hour), when marked acidity or alkalinity is present, and when scanty urine or polyuria is present or immediately follows the withdrawal of residual urine, or follows suprapubic cystostomy for retention, or during gas distention of the bowels.

When the maximum benefit is derived from this pre-operative treatment, if the patient is still below par the question of an anesthetic should be considered. The author thinks that the less fit the patient the less general anesthetic should be used.

Local anesthesia should be used when possible. He thinks that the general practitioner who is most interested in the patient should investigate the results of the simple tests noted above and he thinks that the surgeon should have a great deal more satisfaction from helping a bad case through the danger zone by careful pre-operative treatment than in successfully operating upon a great many patients who recover because they were in good condition when first seeking relief.

G. J. THOMAS.

Robitschek, E. C.: Prostatectomy, with Special Reference to Preliminary and Post-operative Treatment. *J. Urol.*, 1913, xxiv, 634.

The author states that at the present time the operation of prostatectomy is accompanied by a very low mortality. One of the chief reasons for this reduction in mortality is careful, thoughtful, preliminary treatment. He recommends that a 24 hour specimen of urine be obtained, that kidney functional tests be performed, and that preliminary intermittent catheterization, or even a retained catheter with forcing of fluids, be instituted for several days previous to the operation. If it is impossible to pass a catheter, a suprapubic cystostomy under local anesthesia had better be performed and the removing of the prostate put off for a week or so.

The author states that the suprapubic operation is one of choice with the majority of surgeons.

He also states that the anesthetic is a very important factor in the mortality and he gives nitrous oxide gas the preference.

Hæmorrhage is an important factor in the mortality and this should be combated by keeping well within the capsule while enucleating the gland. Salt solution in the rectum and under the skin is also useful in hæmorrhage cases. The drainage tube should be of large caliber with lateral openings.

V. D. LESPINAISE.

Harry, C. R.: Which Is the Preferable Operation, Perineal or Suprapubic Prostatectomy? *Can. M. J.*, 1913, vii, 481.

In deciding whether to use the perineal or suprapubic route for his prostatectomies, Harry depends entirely on the pathological conditions present.

He prefers the suprapubic route in those cases where the prostate grows to a large size; where the bladder is dilated; and where it is impossible, through a perineal incision, with a retractor in the bladder, to reach high enough to enucleate the lateral lobes; and in cases of "ball-valve" outgrowth or pedunculated median lobe.

He prefers the perineal route in cases where there is merely a fibrous enlargement of the middle lobe, raising the inlet of the bladder or a ring of fibrous tissue—Goodfellow's so-called "doughnut hypertrophy."

He makes a general rule that if the glandular tissue predominates, the mass will be apt to encroach into the bladder, and it will be easier to operate from above; while if the fibrous tissue is in excess

it will be much easier to enucleate from below through the perineum.

In the suprapubic operation, there is less injury to the neck of the bladder, and less liability to complications, as incontinence, sepsis, orchitis, or permanent fistula; the end results are more favorable but the mortality is larger than with the perineal operation.

LOUIS GROSS.

Mills, H. W.: Suprapubic Prostatectomy. *Intern. M. J.*, 1915, xvi, 923.

Mills closely follows Freyer of London in his technique of suprapubic prostatectomy, using a chloroform anæsthesia, usually not longer than five minutes and at no time to the point of complete anæsthesia. Before administration of chloroform is begun the bladder is opened under local anæsthesia. During the actual enucleation of the prostate the finger of an assistant is placed in the rectum. The bladder wall covering the prostate is incised by means of a straight, blunt-pointed serrated-edged scissors — immediately backward from the internal meatus. Mills then places the gloved index-finger of the right hand in the rectum and with the left hand in the bladder searches for a line of cleavage. If this is readily found the operation is soon over and if not the operation will take longer. The line of the cleavage readily determined the prostate is rapidly shelled out, tearing through the prostatic urethra at its junction with the membranous portion. After the removal of the prostate, Mills irrigates the bladder with undiluted H_2O_2 followed by hot normal saline solution. His after-treatment is the same as that usually carried out by most operators.

Mills' reasons for selecting suprapubic prostatectomy as the best operation are as follows:

1. It is much quicker than the perineal operation, and consequently requires less chloroform.
2. It is much easier than the perineal operation, especially when a large middle lobe is the cause of the trouble.
3. Large calculi can be more readily removed and encysted calculi more easily dealt with by this route.
4. There is no danger of wounding the rectum in this operation and much less danger of a post-operative fistula persisting.
5. It is a far less severe operation. Old men of eighty or ninety do not stand well a long, bloody, cutting operation.
6. Incontinence never obtains after this operation and the potentia coeundi is better preserved after this than after the perineal operation, in fact it frequently returns after it has been lost.

J. S. EISENSTADT

MISCELLANEOUS

Stewart, W. H.: The Latest Methods of Examining the Genito-Urinary Tract with the Roentgen Ray. *Am. J. Surg.*, 1915, xxix, 404.

One of the most important factors in radiography is the preparation of the patient, with especial view

to ridding the intestine of gas. It is always well to cover both sides completely, as it is a well-known fact that clinical symptoms frequently occur on the side opposite to the one where the calculus is found. Stereoscopic pictures should always be taken to corroborate a suspicious finding on a flat plate. The author also suggests the passage of opaque catheters and opaque fluid, under visual control by the fluoroscope.

Should surgical operation be contemplated it is always well to have roentgenological examination made within twenty-four hours of operation, as the stone may have shifted its position.

H. W. PLAGEMEYER.

Hinman, F.: Urinary Antisepsis. *J. Am. M. Ass.*, 1915, lxxv, 1769.

After careful laboratory study of a large series of substances used in antiseptic treatment of the urinary tract, Hinman concludes that an ideal urinary antiseptic has not been found and that such a one for external disinfection, bladder irrigation, or instillation must have a germicidal power that will kill the invading micro-organisms in the limit of time of exposure, that it must be of stable chemical structure and penetrating in action but neither toxic nor irritating to the mucous surfaces. He further states that no ideal internal antiseptic is known. Hexamethylenamine is the most effective in the largest number of cases. Its greatest use is in bladder prophylaxis. Methylene blue in dilution of 1:150,000 will inhibit the growth of staphylococci; it is diffusible and practically non-toxic. The absence of a deep blue urine indicates imperfect antisepsis. The value is chiefly in renal and bladder affections due to staphylococcus, but in pure urethritis of any type it is valueless. The value of other internal urinary antiseptics, such as salol, sandalwood oil, salicylic, boric, and benzoic acids, is very limited. Relief from urinary irritation is more often better secured by the use of sodium bicarbonate.

J. S. EISENSTADT.

Wollheim, J. L.: Backache in Genito-Urinary Diseases. *Am. J. Surg.*, 1915, xxix, 406.

Both organic and functional diseases may cause pain in the back. In genito-urinary affections backache is a frequent symptom, the kidney condition being more frequently responsible than any other part of the tract. The frequency of backache may be said to diminish as we descend the tract.

It is always well in obscure cases to consider fully the possibility of masturbation, the practice of conjugal organism, or coitus interruptus with its reflex action from the spermatic to the renal plexus.

Neurasthenia accompanying any genito-urinary condition will nearly always bring a complaint of backache, and attempts at intercourse in a case of ejaculatio præcox may produce the most violent backache for twenty-four hours.

With pain in the back as subjective evidence,

and with cystoscopy, ureteral catheterization, kidney function tests, pyelography, wax tipped ureteral catheters, and X-ray pictures to provide objective evidence a diagnosis can usually be reached readily.

H. W. PLAGEMEYER.

Reemerman, L. W.: Effects of Trauma upon the Urogenital Tract. *Urol. & Gynaec. Rev.*, 1915, 30, 601.

The kidney, bladder, and urethra are the portions of the urogenital tract most frequently involved.

Renal trauma results from violence within or without, the latter in the form of puncture wounds, as by a bullet or a sharp instrument or from indirect violence.

Hæmorrhage and shock are the serious elements to be considered. Subparietal injuries, due to indirect violence, are more difficult of diagnosis. Thorough physical examination, cystoscopy, and ureteral catheterization should be made if hæmaturia exists to decide which kidney is injured. The author cites a case with external evidence of injury over the left lumbar region in which the right kidney was the injured one. Expectant treatment is indicated in this class of cases, but it is unwise to wait too long. The author favors early exploratory operation where there is a history of injury and the presence of hæmaturia, prostration, and shock.

Statistics show a mortality of more than 85 per cent where expectant treatment is practiced and operation performed late. The mortality is reduced below 30 per cent where immediate exposure of the kidney is made as a routine measure.

Of the author's five cases of subparietal injury of the kidney in only one was the injury so slight that the patient would have recovered without operation. Three required nephrectomy, and one the suturing of a tear. These cases recovered. The last, a rupture of the kidney with severe shock, died before operation could be completed.

Internal injuries of the kidney occur in the most part where the renal pelvis have been dilated for the purpose of pyelography, the fluid leaking into the kidney structure and producing grave consequences.

The author has had a wide experience in pyelography and renal lavage and recommends as a precautionary measure that not more than 5 ccm. be put into the kidney, and this slowly and carefully.

The ureter may occasionally be injured by unskilled catheterization, the ureter being punctured or torn.

Injuries of the bladder are relatively frequent and are commonly due to crushing injuries, with or without fracture of the pelvis, resulting in rupture or puncture of the bladder. These cases require immediate operation for repair of the injury and drainage of the bladder.

Delays are dangerous, as extravasation of urine into the tissues, followed by sepsis, is likely to result.

Internal injuries of the urethra are usually the result of unskilled instrumentation or overzealous attempts to relieve retention, resulting in false passages or tears in the urethra which may be followed by extravasation or stricture.

Retention can usually be relieved by easy methods. Forcible introduction of a metal instrument should not be resorted to. A filiform, or ureteral catheter, passed through a stricture will often empty the bladder drop by drop. If urethral instruments fail, suprapubic puncture may be easily and safely done.

External injuries affecting the urethra are of frequent occurrence and are usually due to falling astride some object, or to kicks or blows on the perineum. The injury to the urethra may be a puncture, tear, contusion, or complete rupture. Repair of the urethra at once by perineal or combined perineal and suprapubic operation produces better results than simple drainage and attempts to repair the urethra later.

The author emphasizes the following points pertaining to injuries of the urinary tract:

1. All injuries of the urinary tract are grave and may prove fatal.
2. Early diagnosis is essential.
3. Expectant treatment is not always best unless the surgeon is ready to operate at a moment's notice. Delays are frequently dangerous.
4. All external, and most internal, injuries of the urethra should be given immediate treatment.
5. Urinary extravasation is a very grave complication and is an indication for immediate operation to divert the urine from the tissues.
6. Shock and prostration are usually due to hæmorrhage and it is often necessary to operate in the presence of shock in the hope of securing favorable results.

H. G. HART.

SURGERY OF THE EYE AND EAR

EYE

Stark, H. H.: Sudden Blindness Due to Suppuration of the Accessory Nasal Sinuses. *J. Am. M. Ass.*, 1915, lxx, 1513.

Another report of cases of eye complications of sinus diseases, and a review of the literature with a tabulation of symptoms in the order of their reported frequency, has been made by the author. Of 88 cases reviewed the optic nerve was involved in 52. Variations in the pupil occurred as one of the earliest symptoms. Exophthalmos occurred in 11 and involvement of the extrinsic muscles in 11. Central scotoma was the most definite and the one on which the author believes most reliance can be placed. Enlargement of the blind spot was mentioned.

EARLE B. FOWLER.

Ormond, A. W.: Iritis. *Practitioner*, Lond., 1915, lxx, 450.

The author discusses the subject in detail. As to the symptoms, differential points between iritis, conjunctivitis, and glaucoma are mentioned and the differential points of the various forms of iritis given.

As regards etiology, the author says there is no such thing as a rheumatic and gouty iritis, and that iritis is always secondary to some general or focal infection in the body. Seventy-five per cent of cases are venereal in origin and only 25 per cent are due to tuberculosis and other infective diseases.

As regards treatment, the chief reliance rests upon a recognition of the cause and its treatment. The use of atropine and dionine locally is advisable. In intractable cases of tuberculous iritis, subconjunctival injections of 1 ccm. of a one per cent solution of guaiacol is useful.

OTTO M. ROIT.

Cary, E. H.: Malignant Tumors in and Around the Orbit, with Report of Starvation Method of Treatment. *J. Am. M. Ass.*, 1915, lxx, 1540.

Cary gives a brief history of ligation of the external carotid in attempting the starvation treatment of malignant growths and reports 19 cases in which it was used. His conclusions are: (1) that all branches of the external carotid must be tied; (2) that both sides may be operated upon without an interval of two weeks; (3) that sarcoma offers the best results, carcinoma being only retarded in growth; and (4) that results were better when the tumor was not disturbed.

EARLE B. FOWLER.

Schretter, L.: War Injuries of the Eye (*Berufstellung der Kriegsverletzten des Sehorgans*). *München. med. Wchnschr.*, 1915, lxx, 1620.

A careful examination should be made in every case where a patient complains of the slightest eye

symptoms. Even where there is no external evidence of it a very small foreign body may be lodged in the eye and lead to trouble later. One of the most important points to determine is whether a wound is perforating. Decreased intra-ocular tension shows that it is; but even in some cases of normal tension there is a very small perforating injury. If the eyeball is perforated a careful examination must be made to see whether the foreign body is still in it. If there is hemorrhage into the anterior chamber or vitreous body, or if there is cataract, a roentgen examination is often the only means of discovering the body. If it is of iron or steel it can easily be extracted with the giant magnet. The bodies are generally aseptic, so the prognosis is good, even if they remain in the eye for some days. They endanger the function of the eye only if they remain for weeks or months. Through slow dissolution of the iron in the eye fluids siderosis of the eyeball may be caused, the symptoms of which are similar to those of retinitis pigmentosa.

Copper and lead fragments are more dangerous for they very soon cause a dangerous aseptic supuration. If they are too small to be removed with forceps the only thing to do is to wait until they are increased in size by the formation of an exudate around them. Lead fragments may cause a thickening and contraction of the vitreous body which may result in detachment of the retina. Lead fragments in the anterior chamber are relatively harmless. Fragments of stone do not have any chemical effect and may remain in the eye for years without doing any damage if non-infected.

Sympathetic ophthalmia develops only when the wound is penetrating and is followed by chronic iridocyclitis. The latter generally develops eight to fourteen days after the injury, and is manifested by ciliary injection, photophobia, sensitiveness to pressure, and plastic exudate in the anterior chamber. If treatment with atropine, hot compresses, and energetic mercury inunctions does not bring about improvement in four weeks at the longest, operation should be performed; for from the fourth to the eighth week is the most dangerous time for the development of sympathetic ophthalmia, though it may occur after years of quiescence. In acute inflammation there is little danger of sympathetic ophthalmia. The latest conception of sympathetic ophthalmia is that it is an anaphylactic phenomenon due to the absorption of slight amounts of uveal tissue that act as an antigen; therefore in severe injuries of the eye, the eyeball should be immediately enucleated; that is, removed intact with its sclero-corneal capsule. This is often neglected when other severe injuries demand attention. Pros-

theses should be inserted about four weeks after the enucleation and gradually increased in size until a glass eye of normal size can be worn. If this is neglected early the soft tissues contract and a glass eye cannot be inserted.

In skull injuries choked disk is often observed. Some surgeons think this is an unconditional indication for trephining, but Schreiber does not trephine for choked disk unless it is associated with defective vision; sometimes vision remains normal with high degrees of choked disk. A. Goss.

Posey, W. C.: Some Unusual Changes in the Visual Fields; the Result of Vascular Lesions in the Brain and Optic Nerve. *Arch. Ophth.* 1915, div. 125.

Seven cases from the author's practice are reported and 27 cases from the literature are cited.

The first case was that of a woman of 46 who, after a late dinner and exposure, had headache simulating migraine, with loss of the right upper temporal quadrants of the visual fields. Corrected vision was normal and the fundi showed only signs of vascular sclerosis. After disappearance of head pain loss in the field of vision persisted, due in all likelihood to definite changes in the visual cells of the left cortex, in consequence of an interference with their function from intestinal toxæmia, either from hemorrhage, by reason of the formation of a thrombus in the terminal artery supplying them, or as a result of prolonged spasm of the walls of the vessel.

The second case was a right hemianopsia persisting after an attack of migraine, in which a small island of uninvolved field area in the extreme temporal periphery of the involved portion could be distinctly mapped out.

The third case was that of a neurotic woman of 30 in whom, during migrainous attacks, a positive scotoma, taking the form of a large blue eye the size of a bull's eye, was seen in the dark area of the field of vision. This took various positions, never, however, involving the fixation point and it could be mapped out. Cases of similar character following migraine are cited and Posey states that there is ample evidence in the literature that migraine may be the exciting cause of organic brain disease and that an area of softening may follow, which may manifest itself by a permanent paralysis, aphasia, or hemianopsia, and that while such lesions usually occur in individuals who are predisposed on account of vascular disease they may occur in young persons and even in some adults with healthy vessels.

The fourth case was that of a woman of 90, in whom vision of the left eye was lost from thrombosis of the central artery, and several years later, following right hemiplegia, she lost the temporal field of the right eye.

The fifth case was unilateral optic atrophy and contralateral hemiplegia, consequent on occlusion of cerebral vessels, vision in the eye on the side of the paralysis being normal.

The sixth case was monolateral nasal hemianopsia of the left eye from pressure atrophy in consequence of atheroma of the ophthalmic artery.

The seventh case was right homonymous hemianopsia confined to the macular region, from blocking of an end artery in or near the cortical center of the visual area. S. H. Hows.

Hegner: Prognosis of Displacement of the Lens (*Prognose der Luxation*). *Deutsche med. Wochenschr.* 1915, xli, 1502.

From the examination of abundant clinical material it was found that the secondary injuries to the eye varied greatly in the different forms of displacement of the lens. Subluxation of the lens is particularly dangerous on account of frequent and generally severe secondary glaucoma. Among the 24 cases observed there was a secondary rise of intra-ocular pressure in 20 cases. In the majority of cases the eyesight is lost. The results of extraction of the lens in these cases are very unsatisfactory. The prognosis is very much better in total luxation of the lens into the vitreous body. Among 21 cases that were under observation for several years there was rise of intra-ocular pressure in only two.

A series of cases showed almost completely normal vision even after intervals of ten to twenty years, but displacement of the lens into the anterior chamber is very dangerous on account of the mechanical and inflammatory injuries produced. Of 17 cases 6 had secondary glaucoma. Here too the extraction of the lens is very dangerous; among 13 operations there was entire loss of the eye in 5 cases. Good results are unusual. Congenital luxation is benign with reference to secondary injuries. Glaucoma was not observed in a single case. An increase in the displacement was seen only when there was also a defect in the suspensory ligament. A. Goss.

EAR

Fraser, J. S., and Logan, W. R.: Two Cases with Multiple Intracranial Complications of Chronic Suppurative Otitis Media, Recovery After Operation. *Edinb. M. J.*, 1915, xv, 119.

The first case which is reported in detail was one of chronic middle-ear suppuration with extensive cholesteatoma formation, which had so greatly enlarged the mastoid antrum that the cortex was eroded and the cholesteatoma matrix exposed when the mastoid periosteum was retracted at operation. Functional examination before operation had shown that the labyrinth was healthy and that compression nystagmus (fistula symptom) was absent. The caloric reaction to cold syringing was present, with the head in the upright position, thus showing that the superior canal was functioning. A radical mastoid operation was performed, at which time an erosion of the right external canal was noted, and it was found that on applying cold lotion to the

inner wall of the middle ear there was, with the patient's head in the lying position and the right ear uppermost, no conjugate deviation of the eyes to the opposite side. This showed that the right external canal was not functioning; i.e., that the circumscribed labyrinthitis following the fistula had blocked the endolymphatic space in the external canal, but had not so far affected the superior canal. At the first dressing — five days after operation — it was found that the wound was suppurating, but the ear still retained the hearing function. About two days after operation the evening temperature reached 102 or 103° F.; the patient appeared flushed; and headache and vomiting developed. The tongue however remained moist and clean — a condition never before met with by the author in a case of otitic venous infection. There were no rigors. One week later it was evident that the labyrinth was destroyed — complete loss of hearing and of caloric reaction, and deviation in the pointing test. To obviate the onset of leptomeningitis Neumann's labyrinth operation was performed, but in spite of this the temperature continued to rise in the evening to 104° F., and a blood culture showed a pure growth of streptococcus. Consequently, five days later a third operation was performed and the right sigmoid and anterior portion of the right lateral sinus was found to be thrombosed. As there was no bleeding from the bulb end of the sigmoid sinus, the right internal jugular vein was ligatured. Evening fever continued, along with tenderness in the right suboccipital region. Two months after the third operation, pus was found welling up into the wound cavity from beneath the inner end of the floor of the external meatus. A fourth operation was then performed — the posterior operation on the jugular bulb — and pus was evacuated from the bulb itself and from the peribulbar tissues. By the end of three weeks the fever had disappeared and thereafter the patient made a good recovery.

The second case was one of chronic suppurative otitis media with symptoms and signs of purulent leptomeningitis predominating at the time of admission. Lumbar puncture confirmed this diagnosis and the radical mastoid operation was performed, at which time a large extradural perisinous abscess was drained. Repeated lumbar punctures showed rapid improvement in the condition of the cerebrospinal fluid. Within a week the symptoms of leptomeningitis had almost entirely passed off and the cerebrospinal fluid had become clear. The author states that this may possibly have been due to a want of reaction on the part of the patient, caused by the presence of other intracranial complications. At the first operation, in view of the state of the vessel wall, the sigmoid sinus was opened just about the region of the upper knee, and was found to contain fluid blood. After the patient had been in the hospital one week, when the signs of meningitis were rapidly receding, symptoms suggestive of cerebellar abscess on the diseased

side became prominent, but in addition there were symptoms of an otitic venous infection, and an evening rise of temperature to 104° F. Suddenly the signs of the venous infection became still more prominent, and there was marked rigor. The second operation was then performed which revealed a thrombosis of the lower part of the sigmoid sinus, the jugular bulb, and the upper part of the internal jugular vein. Immediately after this condition had been dealt with, the signs of a right-sided cerebellar abscess again asserted themselves. At this period also, symptoms of gangrene of the lung supervened. The third operation consisted in incision of the dura covering the right lateral lobe of the cerebellum and evacuation of a stinking abscess. From this point onward the patient made a slow recovery.

OTTO M. ROTT.

Tomlin, W. S.: Surgical Mastoiditis. *Indianapolis M. J.*, 1915, xviii, 525.

The author defines surgical mastoiditis as that which by the nature of the infection or of the structures involved tends to destroy the hearing, or by chronicity, pain, and other disturbing influences on the activities measurably incapacitates the subject, or through complications, extracranial or intracranial, imperil life itself.

The following conditions the author considers sufficient to place the case in the surgical group as demanding operative interference:

1. An essential anatomic stricture of the external canal.
2. Obstructed or retarded drainage.
3. A very small opening in the drum, especially high up, and exuberant granulations or polypi.
4. An acute exacerbation in a chronic mastoiditis or a recurrent attack.
5. Sagging of the posterosuperior section of the external canal in a subacute case.
6. Marginal perforation of the drum and Prussak's space.
7. Spontaneous nystagmus with which there are associated dizziness, nausea, and difficulties of orientation, especially in the subacute and chronic types and in recurrent ones after childhood.
8. The periosteal and Bezold abscesses.
9. Continued high fever or in adults a marked intermittent type.
10. Very marked tenderness over the antrum.
11. Any meningeal symptoms.
12. Facial nerve involvement.

To prevent any case of mastoiditis from progressing into a surgical one, the author advises (1) the correction of nose and throat conditions which interfere with eustachian functions; (2) removal of polypi, granulomata, and exostoses which obstruct drainage; (3) removal of a diseased malleus or incus through the external canal under local anesthesia.

In conclusion the statement is made that while all cases of mastoiditis are potentially surgical, as a rule only those that are improperly managed proceed that far.

OTTO M. ROTT.

Day, E. W.: Report of Spontaneous Cure of Six Cases of Unrecognized Sinus Thrombosis Accidentally Discovered During Operation.
Laryngoscope, 1915, LV, 157.

In a series of 45 cases of thrombosis of the lateral sinus, the author found 9 in which the classical symptoms were lacking, and he believes that there are a far greater number of such cases than is generally supposed.

Four steps are necessary for the production of a typical sinus thrombosis:

1. The original ear infection.
2. The extension of this infection to the inner wall of the sinus and clot formation.
3. The breaking down of the clot.
4. A free discharge of the broken down material into the general circulation.

The absence of the fourth step changes the symptomatology.

The author classifies sinus thrombosis into three general groups as follows:

1. Those in which the septic material is drained directly into the vein, or aspirated into the opposite sinus.
2. Those in which the distal ends of the clot remain firm and become organized, the center breaking down and draining through a rupture of the sinus wall.
3. Those in which the entire clot becomes organized and sterile with obliteration of the sinus.

The six cases reported belong to the last group, and suggest to the author the following points:

1. That nature effectually cures more cases than is generally supposed — in this series 6 out of 45.
2. That when it does occur, the infection is probably attenuated or of low virulence, creating slight constitutional disturbances.
3. That the presence of pyæmic symptoms indicates an active virulent organism with great resistance to Nature's curative action, producing symptoms that are seldom overlooked and always demand operative interference.
4. In milder cases the diagnosis is rarely made, and, when discovered, Nature has already made the cure.

OTTO M. KORT.

Downey, J. W., Jr.: Corrective Otoplasty. *Ann. Surg.*, Phila., 1915, LV, 485.

The author believes that corrective otoplasty may be of economic value to an individual handicapped by an unprepossessing appearance. He reports two cases operated on for faulty position and malformation of the auricles.

The first case was a man, 27 years of age, in whom the auricles were attached to the head at an angle of 65° , due to an abnormally large curve in the conchal cartilage. The object in this case was the correction of position only, and following operation the ears formed a normal angle of 30° with the head.

The second case was a lad of 9 years in whom the auricles were in faulty position and were malformed. The ears were attached to the head at an angle of 90° . The right ear was crumpled and drooping and lacked an antihelix. The antihelix of the left ear was too prominent. Each ear demanded a specially planned operation. The cartilage was removed at certain points, bent into shape at others, and the result was very satisfactory.

The author believes that each case is a law unto itself and that no set rules can be formulated. He has modified the heart-shaped area of skin denudation described by Kolle in his textbook of *cosmetic surgery*, so that the larger portion of the denudation is on the scalp instead of the ear. This is done to elevate the auricle and to leave a more natural post-auricular sulcus. He believes the incision in and the reshaping of the cartilage to be the most important step in the operation. The cartilage must be removed without interfering with the normal convolutions and without perforating the anterior skin surface of the ear. The Freer submucous knife is most useful for the cartilage incisions. The cartilage should be incised, bent, or partially removed, with as little trauma as possible; it should be sutured with No. 00 catgut and this suture passed through the periosteum to act as an anchor suture in holding the auricle in its new position.

A bandage should be applied to give firm support without pressure; this should be worn constantly until the wound is healed and the skin sutures removed; after that at night for at least six weeks.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Winslow, J. R.: Obstruction of the Posterior Nasal Orifices (Choanæ). *Maryland M. J.*, 1915, lviii, 295.

Two types are found, the congenital and the acquired, the former resulting from developmental anomalies occurring *in utero*, and is characterized by the formation of a partition of bone, of membrane, or of both structures combined, the latter resulting from inflammation or disease.

Symptoms of congenital occlusion are discussed under two groups: those manifested in the newborn child and those first observed at later periods of life. In the newborn there is a constantly recurring cycle, consisting in embarrassed breathing with cyanosis and threatened asphyxia, relieved by crying, succeeded by a brief period of quietude. In older children there are noted only the customary symptoms of mouth-breathing and nasal obstruction.

In infants the diagnosis is suggested if attack is relieved by holding the infant's mouth open and pulling its tongue forward. Examination with a probe through nasal passages establishes the nature of the obstruction.

In older children the diagnosis is based upon a history of nasal obstruction and difficulty in nursing in childhood; the characteristic albuminoid secretion; probing; douching; digital exploration; and anterior and posterior rhinoscopy.

While treatment is surgical, in infants the adoption of the expectant plan is advised. The child is watched every moment and the threatening asphyxia overcome by depressing the lower jaw and pulling the tongue forward, until the habit of mouth-breathing is established, which is usually in ten days.

The period of election for operation is about the tenth year, or when manipulations can be successfully carried out. For membranous obstructions the knife, biting forceps, and cautery are used. For bony plates a chisel and bone forceps are used by some, the trephine by others. Light tamponade is used until healing occurs. OTTO M. ROTT.

Freer, O. T.: The Frontal Sinus: Opening It Through the Nose for Chronic Suppuration. *Laryngoscope*, 1915, xxv, 803.

The author describes his technique which consists in first exposing the bulla ethmoidalis fully to view by severing the anterior attachment of the middle turbinate, or with resection of its anterior half when necessary. If necessary the uncinate process is next cut away. The bulla is entered from its lowest part with a ring curette whose edge is directed obliquely upward, outward and forward and is made to sweep away the anterior ethmoid cells

from the bulla forward and upward to the ascending process of the superior maxillary bone and, if possible, through the sinus floor up into the sinus behind the crista nasalis interna. If the sinus floor proves too hard to penetrate with the ethmoid curette, an especially devised probe curette is passed through the sinus ostium, after the way through it has been found by an ordinary probe, and this probe curette is made to cut its way out of the sinus through the ethmoid cells under the orbital process of the frontal bone, thus enlarging the ostium enough posteriorly for the introduction of a larger curette of the same form into the sinus to clear away all of the cell remnants under the orbital plate. If necessary the ostium is also enlarged forward by cutting away the crista nasalis interna with a straight burr driven by the dental engine. The preference, however, is given to posterior enlargement alone because of the tendency to cicatricial closure of an opening into the sinus made in the forward direction. Where there is reason to expect such closure, one of the author's self-retaining intranasal rubber frontal sinus drain tubes should be placed in the sinus. Where with the sinus open for drainage, marked suppuration continues after the intranasal operation, the external operation must be resorted to. Where great swelling of the lids, exophthalmos, or cerebral symptoms indicate the existence of caries of the sinus wall and progress of the disease beyond it in the form of Killian's sinusitis frontalis exulcerans, the intranasal operation should not be done. OTTO M. ROTT.

Coffin, L. A.: Non-operative Treatment of the Accessory Sinuses. *Laryngoscope*, 1915, xxv, 832.

The author's method is to use a suction apparatus for drawing secretion from the cavities, using in special instances a cannula connected with the suction apparatus. Following this, air is made to enter the vacuumized cavities under considerable pressure, medicated by a nebula of oil variously laden with remedial agents, as Bulgarian bacilli or an iodine preparation.

This procedure is accomplished by means of the author's specially devised instrument which consists of two bottles mounted on the lower side of a tube one-half inch in diameter. The bottles are mounted close together at one end of the tube, the other end of which terminates in an olive-pointed tip about three and one-half inches from the bottles. Between the bottles is a switch-key by means of which the inside of either bottle may be connected with the lumen of the connecting tube, the inside of the other bottle being at the same time disconnected from the same. Between the bottles

also is a small tube extending through the key sleeve for the attachment of rubber tubing which connects the apparatus with an exhaust pump. When the key is so turned as to connect the second bottle with the connecting tube one is able to create a vacuum in this bottle by working the exhaust pump. This bottle is five inches in length and one inch in diameter and is the vacuum bottle of the apparatus. This bottle connects with the nose by means of the olive point and when the nasopharynx is closed off from the oropharynx the nasal chamber and any cavities connecting with it are partially vacuumized when such a condition exists in the bottle.

The first bottle is a refluxing outfit; it is three inches in length and one inch in diameter and may be connected at the proximal end of the connecting tube by means of an ordinary shut-off with a pressure pump or tank. It is the medicine-bottle. When the shut off is open a nebula is formed in the bottle and if the key be so turned as to connect this bottle with the lumen of the connecting tube, the nebula is thrown into the nose through a small tube inside the connecting tube. If the key is not so turned, the nebula is thrown from a safety vent between the bottles. By working both the suction and pressure currents at the same time one may produce in the nose either a suction or compression effect at once and may alternate from one to the other immediately by turning the switch valve between the bottles.

OTTO M. ROY.

Wilson, J. G.: Etiology of Pansinusitis. *Laryngoscope*, 1912, XXV, 842.

The author refers to the great importance of the defective or destroyed ciliated cilia and lymphatic system in favoring the occurrence and persistence of pansinusitis. The points in brief are as follows:

1. The cilia can no longer remove the effusion which accumulates and this accumulation is increased by the action of gravity in such a cavity as the maxillary. This mucous accumulation with its epithelial debris acts as a mechanical irritant to keep up the sinus engorgement.

2. The nasal lymphatic engorgement present in all inflammations may be such that the disturbances in lymphatic circulation in the congested sinus produce a lymph stasis and the initial step in a lymphatic infection, or the presence of the accumulated fluid, and the persistent congestion may at a later stage produce the lymph stasis and infection.

3. The lymphatic disturbance is followed by bacterial invasion, either by direct extension along the lymphatics or by the infection of the exudation from the lymphatics, and the sinuses.

4. In some cases there may be a mechanical interference with the cilia by the bacteria, when there would be the possibility of superficial invasion by micro-organisms.

Other factors mentioned are:

1. Narrowing or obstruction of the ostia or of the nasal cavity from mechanical causes.

2. Disease in the adjacent part of the nasal cavity which has resulted in destruction of the cilia.

3. Scar tissue, tissue devoid of cilia, either from disease or from nasal operation. OTTO M. ROY.

THROAT

Barnes, H. A.: The Radical Treatment of Peritonsillar Abscess by Tonsillectomy During the Acute Stage of the Disease. *Indian M. & S. J.*, 1912, XXXI, 594.

The theoretical dangers of the operation discussed are: (1) that a general anesthesia is not safe on account of the possibility of subsequent pulmonary infection from inspired pus; (2) that it is always dangerous to operate on an acute inflammation of the tonsil, at least to do so extensive an operation as a tonsillectomy, because of the fresh field opened up for infection. As to the first objection, the author dismisses it with the statement that the operation is only indicated in the small deep-seated abscesses and in these a gauze sponge readily takes up the pus as it is evacuated. In the very large peritonsillar abscesses, in which this danger is granted, this operation is not indicated because simple incision easily evacuates the pus. As to the danger of general infection, the author states that the simple incision going through healthy tissue opens up fresh fields more than his technique does. The sinus walls are protected by marked inflammatory infiltration.

The author does not advise this operation before the third day.

As to the technique, the first incision is made through the plica, the retractor is inserted by an assistant under its free edge and the plica and anterior pillar is gently pulled outward and forward. The tenaculum pulling the tonsil inward reveals the line of demarcation between the capsule and the sinus wall. By means of a sharp knife this line is deepened until pus oozes, when a gauze sponge absorbs all secretion. By releasing the pillar the cavity is closed off at will, thus regulating the flow of pus. After the pus has been evacuated the dissection is completed.

The author has operated on ten cases of peritonsillar abscess by this method, with very satisfactory results. The reaction is not marked and the patient experiences immediate relief.

OTTO M. ROY.

Willis, B. C.: The Importance of the Faucial Tonsil as a Portal of Entry in Tuberculosis Cervical Adenitis. *South M. J.*, 1912, XVI, 1074.

The author reviews the literature and reports 25 cases of tuberculous cervical adenitis, of which 86 per cent showed tuberculous involvement of the tonsil.

His conclusions are:

1. Tonsils that appear normal may have microscopic tubercles.

2. The tonsils and adenoids should be suspected as the sites in all cases of tuberculous cervical adenitis.

tis, except in those cases that have other demonstrable lesions about the head and neck.

5. Early removal of tuberculous tonsils frequently induces absorption of glandular involvement, and prevents or reduces the frequency of further systemic infection.

4. Tonsillectomy is the operation of necessity.

3. Necrotic glands should be drained.

6. The best after-treatment should be carried out.

OTTO M. ROTT.

Hurd, L. M.: Report of a Case of an Excessive Bleeder. *Laryngoscope* 1913, XXV, 856.

In this case, which is reported in detail together with a laboratory report of blood examination, there was bleeding for over a week following tonsillectomy in spite of the fact that the coagulation time was normal and that four bleeding points in each fossa were ligated. The author attributes the bleeding to the fact that the intima of the vessels and the cut surfaces would not allow the clotted blood to adhere.

OTTO M. ROTT.

Lynch, R. C.: Technique of Suspension Laryngoscopy. *Laryngoscope* 1913, XXV, 840.

The author's modifications of the instrument consist in (1) a new tooth plate which opens a full inch and a half in the vertical and adjustment of nearly an inch in the horizontal plane; (2) a table top permitting the placing of the crane at any distance on the horizontal projecting platform that will admit of at least ten inches more movement if necessary; (3) the construction of the instrument should be of steel that is very hard but not brittle; (4) a new gag which will open a little over two inches; (5) a ring which is pear-shaped; (6) black tongue spatulas to prevent light reflection; (7) the addition of one more hook to the handle of the spatula; (8) the addition of two light attachments; (9) a long light carrier.

The steps in the technique are illustrated:

1. The assistant holds the patient's head slightly extended with the chin in the middle line.

2. The instrument is closed, the tooth plates adjusted, the hook in an acute angle so as to be out of the way of the arm of the assistant; the mouth is opened, and the tip of the tongue spatula follows along the post-pharyngeal wall until the tooth plates are fixed behind the teeth of the open jaw, care being taken to keep the instrument in the middle line.

3. The mouth gag is opened wide which assures the tongue being held in the middle line and the tip of spatula is driven down under the epiglottis by turning the screw on the pear-shaped ring; the traveling crane is brought into position and the spatula hooked into place.

4. By turning the worm gear joint on the handle, extension is produced on the spatula, which gives a view of the hypopharynx and the posterior half of the larynx.

5. By moving the crane horizontally, the exten-

sion is increased and the interior of the larynx is gradually brought into view.

6. The view is bettered by raising the crane vertically.

OTTO M. ROTT.

Lauda, G. M.: Consideration of the Intervention of Intralaryngeal Polypi (Consideraciones sobre la intervencion de los polipos intralaryngeos). *Rev. de med. y ciruj. de la Habana*, 1916, XVI, 18.

The presence of intralaryngeal polypi is a rare occurrence. The author agrees with Bosworth that there is no more difficult method of extirpating these tumors than by the endolaryngeal route.

The case described was that of a man, 31 years old, suffering from a severe hoarseness, bordering on complete aphonia. His personal history was negative; there was no tuberculosis or cancer in the family. After using cocaine locally, a laryngoscopic examination revealed a peculiar looking tumor on the right vocal cord in the anterior third, reaching partly to the left cord; the tumor was as large as a hazelnut, of a whitish color, with an irregular surface like that of a cerebral convolution, and of a soft consistency; the probe feeling was one of lateralization, for no pedicle could be discovered at its base. The inferior vocal cords were found to be reddened by the pressure. The preliminary diagnosis made was that of a papilloma, a benign tumor.

The extirpation was performed with Mackenzie laryngeal forceps. To avoid the darkening of the space during the intervention, and to prevent its obstruction, the author covered the space with soap softened in an alcohol flame, and rubbed the parts with a piece of tissue paper. To anesthetize the parts, stovaine was used instead of cocaine, as it is less toxic. He anesthetized the fauces first with a 2 per cent solution, then the base of the tongue, the glosso-epiglottic fauces, the epiglottis, etc., with a 5 per cent solution. Later he anesthetized the laryngeal vestibule and at the penetration of the first drops a nauseating spasm was produced, with cough; repeating the injection after two minutes, the reflexes were abolished. Finally he employed a 10 per cent solution in the glottis. With the larynx well illuminated, and with the laryngeal mirror in the left hand, he introduced the forceps into the fauces, and before entering the laryngeal cavity, the patient was asked to pronounce the letter A (for Spaniards the letter E), in this way the epiglottis rises as high as possible, and the laryngeal cavity is better exposed; he then placed the forceps all around the tumor, and made sure he had it in its blades. The hæmorrhage was very slight and insignificant, requiring no intervention. The patient's voice was found to be normal. There was a slight congestion of the cords and aphonia which lasted three days. On the fourth day the larynx was examined again, and a slight overgrowth was found on the anterior extremity of the cords. Four days later, the rest of the tumor was extirpated. Any remains should be cauterized with chromic acid or trichloroacetic acid, but Lauda does not ad-

vise the use of the galvanocautery. On the sixteenth day the patient was discharged, cured. The examination of the tissue showed it to have the constitution of a papilloma, with portions degenerated by an infectious process. RADCK, L. VEBER.

Stewart, G. D.: The Conservative Treatment of Intrinsic Cancer of the Larynx by Thyrocricotomy (Total Laryngofissure) or Thyrotomy (Partial Laryngofissure). *Ann. Surg., Phila.*, 1915, lxx, 829.

The treatment of malignant growths in regions where the lymphatics are abundant and the lymphatic drainage territories ill-defined has recently shown two distinct tendencies: towards a disabling radicalism, or a merely palliative conservatism. This applies to cancer of the larynx as well as to other fields and one or the other method is followed, depending on whether the growth is intrinsic or extrinsic. In extrinsic cancer, rapid spreading of disease is to be apprehended as well as early metastasis and a total laryngectomy is the only method applicable to this class. This is a severe, crippling operation that destroys the voice, but, while there are many recurrences, the end-results are better than those obtained in cancer of the tongue. This is largely due to the fact that an early diagnosis is made possible by symptoms relating to the voice or swallowing, and because these cases are often watched by skilled specialists.

The certainty of a cure of intrinsic cancer by comparatively simple surgical measures is greater than that in almost any other situation. Owing to the lymphatic supply which is scanty and the restraining influence of the cartilaginous walls, intrinsic cancers remain for a long time confined to the inner surface of this organ, and they are as a rule slow growing neoplasms with less tendency to metastasis and, when this does occur, it is in certain definite lines that are well known and can be traced and eradicated. Of course it is essential to make an early diagnosis by a skillful use of intralaryngeal methods including a resection of parts of the tumor for microscopical diagnosis. In over one-half of the intrinsic cancers, the growth is situated in the center of one vocal cord where it can be easily diagnosed and removed, but there is more difficulty in both when it is below and more or less hidden.

Stewart usually performs the operation with the patient under chloroform anesthesia, the tracheotomy being performed either at the time or some days in advance. It may, however, be done under local anesthesia. There are distinct advantages in doing a preliminary tracheotomy, giving the mucous membrane time to readjust itself to the new way of receiving air, and there being in consequence

less coughing or subsequent difficulty in swallowing. One incision usually suffices for both steps of the operation unless the tracheotomy is very low.

After the tracheotomy, the thyroid cartilage is split in the median line, care being taken not to disturb the attachments of the vocal cords. Heavy bone-cutting shears are usually necessary on account of the frequency with which ossified cartilage is encountered in people of the age when laryngeal cancers are most prevalent. If sufficient exposure cannot be obtained by this method alone, the cricoid is also divided in the median line. It is also wise to avoid wounding the epiglottis in the upward splitting, although it is now well known that swallowing is not materially interfered with either by the wounding or removal of this organ.

After the thyroid is split, the larynx is swabbed with a 4 per cent cocaine and adrenaline solution to lessen its sensibility to shock and pain and to minimize coughing. A tampon is inserted down to the cannula to block the trachea from secretion and blood, and the pharynx and esophagus are also tamponed to prevent infection from above as far as possible. The tumor should then be outlined with a sharp knife one millimeter beyond its borders and removed to the cartilage with curved scissors and a sharp periosteal elevator. Control of hemorrhage is obtained by tying or crushing the vessels. The larynx is not packed and the external wound is closed by a few sutures through the perichondrium and soft tissues. Both during the operation and until the patient returns to consciousness, the head is kept low; after that the patient should be in a semirecumbent position. The tracheal tube can usually be removed in from twenty-four to forty-eight hours and the patient is often out of bed on the second or third day. Feeding is rather difficult at first and a nasal tube may be necessary.

Laryngofissure is applicable to over one-third of all cases of laryngeal cancer. It is exclusively adapted to endolaryngeal cancer in its incipient stages. A circumscribed movable tumor near the center of one vocal cord represents the most favorable case for laryngofissure. The operation is sometimes extended to cancer still movable but which has attacked the anterior commissure, the vestibule, or the subglottic space. Laryngofissure is absolutely contra-indicated in all cases in which the arytenoid cartilage and the interarytenoid fold are involved, also in other extrinsic cancers. It is not performed often enough and is sometimes attempted too late. Its extent should be absolutely determined beforehand, otherwise one should be prepared for a semi- or complete laryngectomy. The mortality is small—2 per cent. Speech is always possible, often satisfactory. G. M. COATES.

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INTERNATIONAL ABSTRACT OF SURGERY

MAY, 1916

COLLECTIVE REVIEW

GUNSHOT WOUNDS IN THE PRESENT WAR

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IT may well be said that military surgery has never before held the important place with the medical profession that it does at this time. In a review of the subject it first becomes necessary to describe briefly the causative agents in the production of war wounds; then to consider the characteristic features of the wounds, infection, general treatment, and a brief résumé of wounds in certain anatomical parts.

PROJECTILES

All the warring nations, with the exception of France, England, Germany, and Turkey, use an ogival, reduced caliber bullet with approximately the following salient features: caliber, 0.30; length, 4 calibers; weight, 220 gr.; velocity, 2,000 f.s.; striking energy, 1,954 ft. pounds; penetration in green oak across the grain, 28 inches. The rifling, describing one complete turn in 10 inches, imparts a rotary motion to the bullet at the rate of 2,400 turns per second, which tends to keep the projectile point on during its flight. The bullets are of the mantle type, being composed of a jacket of steel containing a hard lead core, exposed at the base only.

The French, unlike all the other nations, use a solid biogive-shaped bullet, the fore ogive being pointed while the rear one is slightly truncated. The projectile is 8 mm. in caliber; 30 mm. long; and weighs 12.8 grams. The bullet is composed of one solid piece of bronze, and not steel-jacketed.

The German and Turkish bullets are virtually the same: caliber, 0.30; length 1.25 inches, or barely 3 calibers; weight 150 gr. The elongated

point comprises about three-fourths of its total length. This pointed spitze bullet has increased the danger space to something like 750 yards, due to the flattening of its trajectory, a fact made possible by decreased air resistance.

The English bullet is similar to that of the Germans and Turks, except that the core is made up of two separate metals, i.e., aluminum and lead, the lead being in the base and the aluminum in the point. Other agencies causing war wounds are shrapnel, shell fragments, grenades, and bombs. Pistol and revolver wounds are so infrequent in this war that they will be given no space here.

CHARACTERISTIC FEATURES OF WOUNDS

The characteristic features of war wounds are influenced by the size, shape, and velocity of the missiles which inflict them. Wounds from grenades, shrapnel, shell fragments, etc., usually cause excessive laceration, contusion, and hamatomata, conditions favoring intense infection.

The characteristic features of wounds from the ogival-headed and the pointed bullets differ so widely at times that they will be discussed separately. In the Spanish-American, Anglo-Boer, and Russo-Japanese wars the ogival-headed bullet was referred to as a humane bullet, because on penetrating soft parts and joint ends of bone the track was only slightly larger than the sectional area of the missile. These wounds, having only a slight amount of trauma, healed rapidly. Even those in joint ends of bone, formerly the bugbear of the military surgeon, healed rapidly under clean dressings and im-

mobilization. In the case of skull wounds, wounds of the diaphyses, or of cavities containing fluid or semifluid matter the wound was attended with more or less destruction of tissue, especially in the proximal ranges. Sometimes under these conditions the effects were termed as being explosive in character.

Due to the fact that the French bullet is one solid piece, that it does not fragment, and that it is better balanced than those used by the Germans, English, and Turks, the wounds caused by this projectile are not attended with as much laceration of soft tissues or splintering of bone.

The Turks, using the illy balanced pointed bullet, in the Turko-Balkan War caused humane wounds in soft parts and, contrary to previous ideas based on its superior penetration, it was found to lodge in a large majority of cases. This was most likely due to the fact that this war was fought at battle ranges where explosive effects are absent and the remaining velocity of the projectile low. Observers were unanimous in reporting that this bullet turned side on when encountering the least resistance, a fact adding greatly to the mortality of head and abdominal wounds.

In the present war both English and French observers have remarked on the unstable character and the destructive effects of the German spitze bullet. It should be remembered that most of the fighting is being done at close range — within the range of explosive effects — and behind entrenchments. On striking dense bone this bullet tends to turn side on, throwing out the lead contents, which, with fragmentation of the now empty envelope, bone spicula and bone sand, cause great laceration and destruction of tissue, as each of these particles acts as an independent secondary projectile. These wounds are always badly infected from the beginning.

The double nucleus of the English bullet has been the subject of much controversy recently. Von Bruns (2) believes that doubling the nucleus adds to the tendency to fragmentation and that the effects are nothing short of those observed from dum dum bullets. To increase the stability of their bullet the English lengthened it, using the lighter metal so as not to materially increase its weight. I believe that they have a more stable bullet by so doing and that its disintegration is caused only in the same way as the other pointed bullets. It is doubtful if more wounds showing dum dum effects are found on the German than on the English side. It was a grievous error to have adopted a pointed bullet

at all from a humane point of view, but the tacticians and ordinance departments did so because of its lighter weight, decreased air resistance, and therefore increased danger space.

INFECTION OF WOUNDS

Infection of gunshot wounds and wounds in general has been exceedingly prevalent during the present war. Generally the infection is caused by the bacillus of Nicolaier or that of Welch, complicated by streptococci and staphylococci. Fleming believes that the staphylococcus albus favors the development of the bacillus of Welch and promotes the incidence of gas gangrene.

Observers at the front find that the bacilli of Welch and Nicolaier may abide in a great variety of wounds without clinical manifestations, their growth being more luxuriant in wounds attended with a special amount of laceration, contusion, and devitalized tissue.

TREATMENT OF WOUNDS

First-aid treatment at the front is not receiving much favor, but it would seem that if the skin were first sterilized with tincture of iodine, half strength, much more favorable results would be obtained. Those familiar with the widespread infection in contused and lacerated gunshot wounds have never advocated the use of a skin disinfectant and a first-aid dressing with the hope of removing the deep-seated infection.

The chief difficulty in the care of war wounds is the inability of the military surgeon to control environment. In civil practice every faculty is at hand at once, while in war time it is hours and often days before the case can be brought under control for proper care and treatment, and during this time infection often spreads and becomes systematic.

As to the management of grave wounds with bone involvement there seem to be two schools: one prompted by the teachings of Sir W. W. Cheyne (3) and the other by Sir Almaro E. Wright. Cheyne believes that these infections are easily controlled by the stronger antiseptics, such as pure carbolic acid or some of its stronger dilutions. He states that the hopeless view of some surgeons of removing infection from this class of cases "is probably founded on experiments by LaGarde and others carried out a good many years ago." In these experiments, reported first in 1901 (4), the writer showed that carbon particles placed on the skin of an animal were driven into the soft tissues a distance of 17 mm. when the animal was fired into with a

0.45 caliber bullet from the old Springfield rifle. From this it was inferred that micro-organisms could likewise be driven into the tissues. Carbolic acid, as Cheyne believes, may be the most diffusible antiseptic but it is doubtful if its diffusibility is equal to the task of reaching throughout the extensive infected area of a compound gunshot fracture showing explosive effects.

Wright is very much in accord with the views entertained by most surgeons. He believes that a projectile carrying infection, filth, etc., into the wound "will implant them far beyond the reach of any prophylactic application of antiseptics." He advocates the use of early and free drainage; lymph lavage by the use of fermentations which induce active hyperæmia. In addition he employs a hypertonic irrigating fluid composed of 0.5 per cent of citrate of soda and a 5 per cent solution of salt.

Dakin and Carrel (5) have advocated the use of a new antiseptic which is made by mixing solutions of sodium carbonate and chlorinated lime. This solution is filtered, and to the clear liquid, boric acid is added to slight acidity. The reports from the use of this antiseptic are very encouraging.

Tuffier, consulting surgeon to the French armies in the field, divides the cases of gas gangrene, due to the welch bacillus, into two clinical varieties: (1) hyperacute gangrene, which spreads with great rapidity and ends fatally within 24 hours, a variety which is beyond the control of the surgeon; (2) a superficial gaseous gangrene which spreads in the cellular tissue under the skin and is amenable to treatment when early and free incisions are made to relieve the constriction.

Injection of oxygen or peroxide of hydrogen into the cellular tissue has also been used with good effect. The lower limbs are more frequently affected than any other part of the body.

The reporters find that tetanus is much less frequent now than it was at the beginning of the war. It has become the common practice to immunize all wounded with antitetanic serum.

Shock is naturally among the more important symptoms of gunshot wounds. Tuffier recommends the use of morphia hypodermatically in the treatment of shock, and attention may also be called to the splendid results obtained in the Russo-Japanese War from the use of the following mixture hypodermatically:

Camphor.....	1 part
Ether.....	4.5 parts
Olive oil.....	4 parts

Incision and excision. As a new feature of treatment, Milligan and others have obtained

good results, in specially selected cases, by excising the infected and devitalized tissues and then suturing the wound.

Hæmorrhage. External primary hæmorrhage is seldom seen in the present war. It is naturally controlled by ligation and constriction at the front. Secondary hæmorrhage, however, is more common because of the prevalence of infection. In aseptic cases Tuffier applies ligatures to both ends of the injured vessel in the wound, while in infected cases he ligates the artery on the proximal side in healthy tissue. Arterial and arteriovenous aneurisms are best treated by longitudinal suture. Spontaneous cure is not uncommon. Treatment of aneurismal varix and varicose aneurism is the same as that of other forms of traumatic aneurism; i.e., rest in bed, immobilization, etc. The operative treatment depends on the vessel affected and the amount of disturbance present.

Gunshot wounds of the head. The proportion of head wounds to wounds of other parts is greater than formerly. With the old tactics, where battles were fought in the open, it was 8 per cent of all wounds. In more recent wars—the Anglo-Boer, Spanish-American, etc.—it ranged from 15 to 20 per cent, while in the present war with the great amount of trench fighting the percentage is expected to rise even higher.

In all head cases, especially the minor ones, careful examination should be made for any disturbance of cerebral function. This is especially true of the tangential shots with the new rifle bullet, as it is very prone to fracture the inner table without mutilating the outer table.

Roberts (6) recommends excision of the scalp wound beyond the contused area. When fracture is discovered and lacerated brain tissue is found the parts should be explored, all foreign matter including bone fragments removed, and the wound closed with or without drainage. Urotropine (gr. xx., t. i. d.) should be given in all head cases from the date of admission. In penetrating wounds of the head this treatment is applicable to the wounds of entrance and exit.

Gordon Holmes and Percy Sargent (7) have published their observations on symptoms of injury of the longitudinal sinus, which deal with conditions rarely seen in civil practice. In fracture, especially from tangential shots, venous disturbance, due to the superficial course of the cerebral veins, is very common. Striking clinical effects are noted when the sinuses, into which the veins flow, are afflicted. In ordinary hemiplegias the fingers, then the hands, wrists, etc., suffer most and recover more slowly, but in hemiplegias

from sinus involvement the reverse is true. The fingers may escape entirely or be only slightly involved and when involved the paralysis disappears rapidly.

Tuffier states that most of the French surgeons treat gunshot fracture by immediate trephining. Transport of these cases is prohibited until they are out of danger. Removal of lodged missiles should not be attempted unless located in accessible parts of the brain by X-ray or other reliable means.

The painstaking efforts to eliminate and prevent sepsis in brain injuries will greatly decrease the mortality in these cases by preventing complications like hernia cerebri, brain abscess, etc., conditions usually ending fatally.

Gunshot injuries of the spine. The present war has added little to the knowledge obtained since the advent of the reduced caliber military rifle. The amount of energy conveyed in the form of vibratory force through the bony framework of the spine is responsible for certain temporary, though sometimes permanent, pathological conditions resulting in functional changes. The bullet does not necessarily enter the spinal canal in these cases. The transmission of vibratory force causes a traumatism which ends in destruction of the cord with all the symptoms of a transverse lesion.

Peripheral nerves. Delorme (8) and others advocate immediate resection and suture of injured nerves, but this plan has not been adopted as a rule although it is applicable when one finds a divided nerve in the field of some other operation. Under strict asepsis a divided nerve may be sutured at the time of the primary dressing. Observers note an increased number of divided nerves in this war, due no doubt to the readiness with which the new bullet key-holes, and to wounds from sharp shell and grenade fragments.

Gunshot wounds of the chest. Wounds of the chest, since the adoption of the new military rifle, were classed as humane until the introduction of the spitzee, or pointed, bullet in the Turko-Balkan War of 1912. Increased use of shrapnel has also caused a great increase in the mortality in this class of cases. Wounds from shrapnel are likened to those due to the old armament used in the Civil and Crimean wars when the mortality was rated from 67.5 to 91.6 per cent. The principal dangers in chest wounds are complications such as pneumothorax, hemothorax, and infection. Pus should be evacuated as soon as discovered. Hemothorax, unless large, needs no operative interference.

Penetrating and perforating wounds of the abdomen. The divergent views formerly held by civil and military surgeons on the operative treatment of these wounds have, to a large extent, disappeared in the present war. The wounds caused by the reduced caliber bullets in recent wars gave the impression that a certain proportion of abdominal wounds were so benign that they naturally recovered without operation, although the wounds of entrance and exit pointed to visceral involvement. This happy outcome was attributed to the passage of the projectile between knuckles of gut without opening the lumen, but we now know that the benign character of these wounds is due mainly to occlusion of perforations in the gut by eversion of the mucosa.

The greater use of shrapnel and the pointing of the rifle bullet have increased the mortality of abdominal wounds. Many observers comment on the relative scarcity of abdominal wounds in the field hospitals, the inference being that the large majority of this class of wounded do not live long enough to reach the field hospitals.

Gunshot injuries of joints. The introduction of the unstable pointed bullet and the greater use of field artillery is increasing the severity of this class of wounds as compared to those caused by the ogival-headed bullet. In 17 cases (9) of gunshot wound of the knee in the Santiago campaign by ogival-headed reduced caliber bullets, there were neither deaths nor amputations and 81.1 per cent were restored to duty. It is doubtful if such a record of good results will ever be duplicated with the use of the present armament.

Tuffier finds that rifle bullet wounds of the knee-joint usually heal kindly, but injuries of this class caused by shrapnel or shell fragments are prone to suppurate and undergo ankylosis after prolonged convalescence. He prefers resection of the joint to amputation because reamputation or other secondary operation was necessary in 10 per cent of the cases observed. Through and through drainage is the rule in the presence of infection. Excision or amputation is in order when suppuration fails to yield to persistent treatment.

Gunshot fractures of the long bones. In these fractures the three prime requisites are drainage, immobilization, and frequent redressings. In this, as in all other wars, infection in fractures consumes the most of the surgeons' time, and it is pretty constant in bone injuries.

Amputation by circular plane section. This form of amputation was revived again in the

early part of the war in some cases of gas gangrene for the following reasons: (1) It is the quickest method, a valuable point when there is great prostration. (2) The wound is open. (3) It is only a temporary measure and everything can be righted by secondary operation if necessary. With facilities and sufficient personnel it is not necessary to pursue this ancient method.

IMPORTANT FACTORS IN THE PRESENT WAR

Sir Anthony Bowlby (10) brings out the wide difference observed in the pathogenic conditions of war wounds in the Anglo-Boer and the present European war, based on the nature of the terrain in the two wars. In South Africa the battles were fought in an open country, sparsely settled, and but little cultivated. The climate was dry and sunshine was prevalent throughout the year with rare exceptions. The pathogenicity of wounds was not of special significance. Tetanus and gas bacillus infections were seldom seen.

In Belgium and Northern France, the scene of Bowlby's recent military experience, the terrain is thickly inhabited by a population devoted to agricultural pursuits and the raising of live stock. The climate is damp, and sunshine is as rare as cloudy days are in Africa. The soil is necessarily a prolific incubator for all kinds of aerobic and anaerobic microbes. Contamination of gunshot wounds in soldiers wearing clothing laden with the dust and mud from such a terrain is the rule. Another factor which has prevailed in the present war to add to the frequency of infection in gunshot wounds is the wide difference in the characteristic features of the wounds themselves. In a general way the wounds in the South African War were very much less severe. They were inflicted by ogival-headed bullets in the large majority of cases, at battle ranges which approximated a half-mile. The bullet was well balanced and generally made a regular impact. Wounds in the soft parts, the joint ends of bones, and lungs were very infrequent in the Boer War, and less severe than those which occur in the trench fighting in the present war.

CHARACTER OF MISSILE

The character of the missiles used in the present war is more varied than in any previous war. It is not yet possible to give the proportion of wounds by rifle bullets, but the fact that the bullet is employed by the hand rifle and machine gun of all of the combatants will make bullet wounds, as usual, the most frequent in war. The instability of the pointed bullet as compared to the ogival-headed bullet has a tendency to produce

lacerated wounds when the shot is delivered at close range or when the bullet turns, a thing it frequently does, at the moment of impact. The pointed bullets of the Germans and English are very much the same in ballistic value, and Bowlby very much doubts if either bullet disintegrates from the resistance which it encounters in the bony framework of the human body. His idea is that deformation and disintegration of bullets are most generally found as a result of ricochet shots. The French bullet, made up of a copper compound and having neither core nor mantle, is solid and homogeneous throughout. It is longer and heavier than either of the other bullets, but it is doubtful if the nature of the wounds it inflicts is different from that inflicted by the English or German bullets.

In addition to bullets, there are a number of other forms of missiles to be considered.

1. Shrapnel shells contain from 250 to 400 round bullets of lead which are soft in some shells and hard in others, of an average diameter of one-half inch. Each shell is provided with a time fuse to burst in the air over the object aimed at. The bullets are propelled in a cone-shaped stream and the violence of their impact is proportionate to the velocity of the shell at the time of bursting. Wounds may also be caused by the metal case, which is a foot in length and weighs several pounds, but the character of the wound it causes does not differ from that produced by the ordinary shell fragment. The velocity of the round bullets is never so great as that of the hand rifle bullets, and their effective range is never as great.

2. High explosive shells vary in weight from a few pounds to about one ton and they consist of a thick iron case, containing in a central cavity a violent explosive charge. In the German shell the charge is 200 pounds of trinitro-toluene. The shell is made to burst on percussion by a detonator. The injury caused by these shells is from jagged fragments into which the shell breaks up at the moment of impact, as well as from portions of buildings, when pieces of stone or brick are scattered broadcast with immense force. The expansion of the gases is also sufficient to either kill or disable those in the vicinity of the explosion.

3. Bombs, hand grenades, rifle grenades, trench mortar bombs, etc., are all made of a case of iron or other metal containing a large charge of high explosive. The bomb case is composed of iron about one-half inch thick, which is at times incompletely divided into segments one-half inch square. The German grenade is

composed of thin steel or other metal. The fragments which issue from the explosion are very numerous and small; some of them are pointed and with an edge like a knife; others are quadrilateral. The German bombs contain irregular jagged pieces of loose metal—rough iron boot nails one-half inch long and pyramidal in shape.

All forms of shells and bombs scatter various kinds of extraneous matter from the vicinity of parapets, like stones, earth, pieces of timber, gravel, sand, etc., which are apt to injure more especially the head, face, neck, and shoulders of soldiers standing in the trenches.

CHARACTER OF THE WOUNDS

Bowlby's description of characteristic features of proximal shots from the military rifle bullet, which show all of the lesions that mark so-called "explosive effects," is by far the most striking part of the Bradshaw lecture. The writer is able to comment feelingly upon this part of the lecture because it describes in detail the observations of the early investigators who resorted to the shooting gallery and simulated ammunitions in experiments on cadavers to determine the effects of the new armament on the human body. Those of us who, 30 years ago, described the horrible effects on the cadaver which Bowlby has so recently seen in actual war, were then accused of exaggeration. The frightful effects described were attributed to the result of firing in putrid flesh. The German, French, English, and American experimenters who first tried the high-power military rifle did so by shooting into cadavers with simulated charges. They fired at a fixed range and reduced the charge of powder, thus giving the bullet the remaining velocity which it should possess, all the way from 50 to 2,000 yards. In the early tests of the Krag-Jorgenson rifle, which were made in this country, results of which appeared in the annual report of the Surgeon-General of the U. S. Army in 1891, the explosive effects described therein tally exactly with the highly destructive effects of the Lee-Medford, Lebel, and Mauser rifles of the foreign experimenters. All of these reports are in accord and the horrible effects described in the Bradshaw lecture stand out forcibly as a vindication of the work of those early investigators. The experimenters knew whereof they spoke when they described the effects of proximal shots, and they were never in a position to compare their experiments with battle wounds, because the latter, in all wars before the present European war were received at battle ranges averaging one-

half mile, where explosive effects are unknown. It has taken a quarter of a century to convince the "doubting Thomases" of the highly destructive effects of the reduced caliber military rifle at close range, which can be seen daily in the trench fighting now going on in Flanders and Northern France.

Bowlby states that the wounds in the present war are as varied as the projectiles themselves. The "normal" bullet wound so common in the South African War, characterized by a tiny aperture of entry and exit, is seldom seen in the present war. Bullets "tear the soft tissues to rags and blow out the muscles and fascia through great rents in the skin." When a large bone is struck the damage is yet greater, the wound having the features of laceration observed in a wound caused by a shell fragment. "This is due to the fact that the bullet traveling at the height of its velocity not only smashes the bone, but also imparts its momentum to the shattered fragments and drives them in every direction, so that the injury to the soft tissues is inflicted in great part by the fragments of bone themselves."

Wounds by shrapnel bullets are not so extensive; they more frequently lodge, and they are often multiple. The wounds caused by high explosive shell fragments, bombs, and grenades are so varied that it is not possible to describe any of them as a type. They are all ragged and lacerated. The large fragments tear away limbs or huge masses of skin and muscle. The neighboring tissues show widespread contusion and extravasation of blood. Wounds by smaller shell fragments and from bombs and grenades are lacerated in proportion to the size of the fragment and they are nearly always multiple. The wounds in this war stand out very distinctly as a class by themselves among war wounds and they have none of the features of the wounds inflicted in civil life. The traumata concerned in the causation of the latter tend to produce injury to the tissues by slowly crushing them from without; whereas in all penetrating wounds by bullets and missiles of all kinds moving at great speed the injury is produced by a divulsive or expanding force acting from within. Bowlby adheres to the older theory that the injury "is largely due to the wave of compressed air which the bullet drives in front of it and which expands within the tissues." This assertion comes as a surprise since the writer has always felt that the theory of compressed air as a factor in the causation of destructive effects in gunshot wounds had been exploded long ago. It is inconceivable that very much of a cushion of air can accumulate on



Fig. 1. Destruction of the elbow-joint by a bullet wound. Gas gangrene. Paralysis of median and musculospiral.

the tip of a spitze bullet when we remember that the latter tapers to a distinct point.

MICROSCOPICAL EVIDENCE OF WIDESPREAD INJURY

Very interesting data are presented as regards the widespread injury to soft tissues, such as muscle-fibers, kidney and liver structure, as shown by necrotic changes and extravasation of blood extending as far as three inches from the channel of the gunshot wound. Microscopic sections of kidney tissue showed great vascular engorgement of the capillaries some distance beyond the apparently injured tissues. For the microscopic appearances of the tissues that surround the channel of a gunshot wound in soft parts only, with the transmission of carbon particles placed purposely upon the skin of animals before firing into them, the writer begs to refer the reader to the Mueller lecture already referred to.

OTHER FAR-REACHING EFFECTS

The author reports two cases which show the mutilating effects that can occur by the lateral energy of a bullet when it is transmitted in the form of vibratory force: (1) An officer was shot transversely across the face, the wounds of entrance and exit being below and through the



Fig. 2. Radiograph showing enormous projectile, a cartridge of a Lebel rifle.

zygoma respectively. Although the track of the bullet was an inch below the level of the base of the skull the latter was fractured, the dura was unhurt, but the frontal lobe and one temporo-sphenoidal lobe were more or less pulped. (2) A young officer was shot across the back of the neck; the wound was apparently superficial, but he died in two days. At necropsy it was shown that the bullet had only broken off the tip of the sixth cervical spine, the laminae were not fractured and the dura mater was intact, yet the cord had been contused and the gray matter was broken up by hemorrhage. Cases are also cited of hemorrhage in the spinal cord ending in death when the bullet had passed through soft tissues only in the vicinity of the spinal column; instances are also cited of abdominal wounds with torn intestines from the vibratory force of the bullet in which the peritoneal cavity remained uninjured by the bullet itself.

CONDITION OF THE WOUNDED

A room full of wounded men just gathered from the battle line is usually very quiet as a result of sleep on the part of the majority, and collapse and shock among the rest. Vomiting and retching are frequently found in cases of shock, for which pituitary extract is given, with intravenous injections of normal saline solution and enemas of hot water and brandy.

SECONDARY COMPLICATIONS OF WOUNDS

All gunshot wounds in this war are infected at the time of the receipt of the injury, faecal microbes and streptococci being the chief offenders. The method of treatment of infection recommended by Sir Almaroeth E. Wright is also preferred by Bowlby. Wright's references to the bacterial flora of war wounds follow closely the findings of Fleming and others. The anaerobes attack devitalized tissue by preference. "The more severe and extensive the injury, and the more tissues are lacerated and devitalized, the more the wound is likely to be badly infected."

In civil life the patient's environment which is dominated by the surgeon is entirely favorable to life and limb, but in war surgery the inability of the surgeon to control this environment, and the virulence of the infection in badly lacerated wounds, especially in the present war, are very detrimental factors in prognosis. The use of antiseptics in the prevention and amelioration of sepsis in war should be followed as constantly and persistently, whenever it is practicable, as it is in civil life.

Fractures and badly lacerated wounds should receive all the care that it is possible to bestow upon them, bearing in mind that they are deeply infected and that the salvation in such cases depends on free drainage, frequent irrigation with mild antiseptic solutions, and frequent redressing.

The treatment of advanced sepsis in wounds is best met by prolonged immersion in an antiseptic fluid whenever this is possible, or constant irriga-

tion with saline or antiseptic fluids. The saline hypertonic treatment finds its greatest use before the separation of the slough, and up to the time that a granulating surface has appeared. The subsequent use of nitrate of silver and sulphate of zinc is advisable. The hypochlorous acid treatment as advocated by Dakin and Carrel is a most important advance in wound treatment, more especially when used in recent wounds, before suppuration has occurred, and it has to a great extent displaced all other forms of treatment in many of the casualty clearing stations. It is believed to have prevented or arrested the progress of gas gangrene in many instances. It has the faculty of being a non-irritant to the tissues at the same time that its antiseptic value is sufficient to destroy virulent micro-organisms.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Watson, C. H.: An Improved Substitute for Iodized Catgut Sutures. *Surg., Gynec. & Obst.*, 1916, LVII, 112.

In view of the many objections to the general use of iodine in the preparation of suture materials the following brief investigation was undertaken. As suggested by D. Macfarlan, potassium mercuric iodide was selected as the possible ideal germicide. Following Park's method in general, the germicidal power was determined with reference to three types: staphylococcus pyogenes aureus, bacillus coli, and bacillus subtilis. The conclusions are as follows:

1. Potassium mercuric iodide in alcoholic solution in a dilution of 1:1000, has more than ten times the germicidal efficiency of a 1:100 solution of iodine in alcohol.

2. The impregnation of catgut sutures with potassium mercuric iodide, by increasing the tensile strength of the gut, offers a distinct advantage over the similar use of iodine.

3. Catgut sutures impregnated with potassium mercuric iodide, when sealed in tubes with chloroform, show no deterioration when the tubes are subjected to boiling. Since iodized sutures are ruined by such treatment, the superiority of potassium mercuric iodide over iodine as a germicidal impregnating agent is obvious.

Turner, G. G.: The Abuses and Dangers of Drainage Tubes. *Brit. J. Surg.*, 1916, III, 552.

Turner gives an account of a personal experience with lost drainage tubes and advice concerning the use of drainage in general. A tube can actually drain only some pre-existing cavity, such as an empyema. Apart from that it may keep a tract patent between some deeply situated septic focus and the skin. It is hardly necessary to retain a drainage tube longer than from fourteen to twenty-one days. Very often a counteropening will do away with the necessity of a long drainage tube.

He lays stress on the danger of placing drainage tubes in contact with blood-vessels on account of resulting hemorrhage, when the vessel becomes eroded. He quotes Weissenbach and Bertler:

1. That simple contact of the drainage tube with the vessel when both are aseptic will cause no ulceration of the vessel.

2. Infection causes an arteritis with the resulting damage to the vessel wall from pressure of the tube.

3. In an infected area it is never advisable to leave a drainage tube in contact with the vessel for more than two or three days.

He advises boiling drainage tubes for ten minutes, immediately before using them, or boiling them and then storing until used in 1:20 carbolic or 1:1000 perchloride of mercury.

H. G. SLOAN.

Spain, K. C.: and Loeb, L.: A Quantitative Analysis of the Influence of the Size of the Defect on Wound Healing in the Skin of the Guinea Pig. *J. Exp. Med.*, 1916, XXIII, 107.

The authors have undertaken to determine the influence of the size of the wound on the rate of wound healing in the different types of skin, and in this communication they deal with the results obtained in the guinea pig. In one set of animals a thin flap of skin measuring approximately 2 sq. mm. was removed from the ear of each animal, in another set flaps measuring 4 sq. mm. were removed. After 2, 5, 7, 9, 11, and 14 days pieces were cut out in each set for microscopic examination. Three to five pieces were examined at each period, in both the 2 sq. mm. and the 4 sq. mm. series. All the pieces were cut into several sections. The same measurements were made as in the previous investigations. The results are given in a series of tables, and are summarized as follows:

The larger the wound, the more rapidly the tongue enlarges and the earlier the closure of the wound takes place. Larger wounds heal, therefore, more quickly than smaller wounds within the variations in the size of the wound chosen in the experiments.

Both outgrowing of the tongues and contraction of the wound are concerned in the closing of the wound. A marked contraction sets in in the period preceding the closing of the wound and continues over a longer period with gradually diminishing intensity. The contraction, therefore, sets in earlier in the larger wounds. The contraction is also absolutely greater in the larger wound.

During wound healing the mitoses increase first markedly in the old epithelium and only very few mitoses can be found in the outgrowing epithelium during the first two days. Very soon the mitotic proliferation extends to the tongue and the number of proliferating cells may here become greater than

in the old epithelium. With the closure of the wound a sudden fall in the number of mitoses takes place in both series. This fall is greatest in the tongue. Throughout the time of observation the number of mitoses was greater in the smaller wound.

It is probable that the difference in the rapidity in the outgrowth of the epidermal tongues and the resulting difference in the time of closure are mainly responsible for the difference in the variations in mitoses in the larger and smaller wounds. The longer the period of time over which the pull of the epithelium extends, the greater is the number of mitoses in this area. Therefore it is greater in the y-m-m series. Closure of the wound is followed by a sudden decline in the number of mitoses, especially in the area of the defect.

The size of the epithelial cell and nucleus increases soon after the making of the wound. A maximum is reached in both the larger and smaller wound in the period just preceding the closure of the wound; this maximum is therefore reached earlier in the larger wound. Absolutely the maximal size reached in both kinds of wounds is approximately the same or only a little higher in the larger wounds.

The closure of the wound causes an increase in the number of epithelial rows over the defect. This increase is therefore reached at an earlier period in the larger wound. The increase is greater in the larger wound owing to the greater pressure which the two opposing cell layers exert upon each other in the larger wound. In the old epithelium the maximum in the number of cell rows is apparently reached slightly before the closure of the wounds. It seems that the epithelial movements leading to the closure of the wound start in the old epithelium and extend wavelike toward the wound.

It thus appears that the primary process in the wound healing consists in movements of the epidermis toward the wound; that these movements are carried out with greater energy in the case of the larger wounds; that the pull of the epithelium calls forth mitotic cell division; and that pressure exerted by epithelial cells upon each other leads to a rapid diminution in the mitotic proliferation.

GEORGE E. BRIDLEY

Roberts, J. B.: The Etiology of Post-operative or Wound Scarlet Fever. *Med. Chron.* 1916, xxi, 12.

The author reports four cases of scarlet fever following operations which he observed. One occurred in a woman of 27 years, twelve days after appendectomy. The second was seen in a boy, 5 years of age, two days after a cleft-palate operation. The third was in a boy of 6, three days after a slight operation on the lip. The fourth appeared two days after a cleft-palate operation.

These four cases are interesting, perhaps, in the study of the question of the real existence of surgical or wound scarlet fever, which is practically the question of the possibility of the scarlatinal virus entering through a surgical wound. The fact that these cases

were all examined by skilled men constantly seeing cases of scarlet fever makes the diagnosis irrefragable.

EDWARD L. CORRELL

Davis, B. F.: The Relation of Morphine to Post-operative Complications and Immunity. *J. Am. M. Ass.* 1916, lxxv, 232.

Because of the tendency to blame morphine for the occurrence of many disorders which appear during and after operations, a study was made of the records of 469 patients and of the immunity curves of a series of morphinized animals in order to determine the reasonableness of this idea.

The use of a combination of morphine and atropine before operation was found to have but little effect in the prevention of post-operative shock. An attempt was made to trace a relation between morphine administered and post-operative nausea and vomiting, gas pains, and post-operative disturbances of the urinary apparatus. It was concluded that post-operative nausea and vomiting was very little influenced by the morphine administered, but was markedly influenced by the depth and duration of the anesthesia. Gas pains are determined chiefly by the tissue involved in the operation, peritoneal trauma being followed by tympanites in about 45 per cent of cases. The general anæsthetic also has some influence. Ether and peritoneal injury are the two important causes of post-operative retention of urine. Morphine plays a negligible part in the production of these conditions. In experiments on morphinized and control animals no constant difference was noted between the activity and opsonizing power of the leucocytes and serums from these animals. There was, also, no suggestion of the effect of morphine upon the hæmolytic curve. Morphine, preceding local anesthesia, added nothing to the efficiency of the latter and caused post-operative nausea and vomiting in 25 per cent of the cases.

The conclusions are drawn that the pre-operative use of morphine should be abandoned, but that the post-operative use of the drug in doses of from one-eighth to one-sixteenth of a grain at six-hour intervals may be permitted when the suffering of the patient demands it.

E. K. ARMSTRONG

ANÆSTHETICS

MacGowan, G.: Local Anæsthetic. *Calif. St. J. Med.* 1916, xiv, 6.

A local anæsthetic to be satisfactory must be capable of producing a perfect anesthesia of the skin and retain its inhibitive power for a reasonable time, without disagreeable after-effects, either local or constitutional. A local anæsthetic must not of itself cause pain, and to obtain the full anæsthetic effect without injury to the tissues it is necessary that the solution used be isotonic with the body fluids. A 0.2 per cent solution of sodium chloride is isotonic with human blood and should be used in the preparation of solutions for local anesthesia.

The local anæsthetic agents in the market are cocaine and its derivatives, α - and β -eucaine, holocaine, aneson, and acaine; the orthoform group, orthoform, new orthoform, nirvanin, anæsthesin, subserutin, propaesin, and zykliform; the amido-alcohol group, stovaine, alypin, and novocaine; antipyrin and chloride of quinine and urea.

Cocaine has been largely abandoned as a local anæsthetic because of the frequent occurrence of poisoning and death, the impossibility of sterilizing it without deterioration, and the short duration of its analgesia. Tropococaine, a synthetic product, lacks the vasoconstrictor properties of cocaine, but is the ideal agent for spinal anæsthesia. The other members of this group have nothing to recommend them with the exception of holocaine which is useful in the treatment of corneal ulcers and foreign bodies in the eye, as it anæsthetizes without dilating the pupils.

The members of the orthoform group are powders with anæsthetic properties when brought into contact with nerve-endings. They are used as dusting powders, suppositories, or salves. Anæsthesin is the most efficient and is of use also in painful affections of the upper digestive tract.

Of the alkaline esters stovaine has been highly extolled but many unfavorable reports of its action have been published. Novocaine is not irritating when injected into the body tissues, it may be re-sterilized without much effect upon its anæsthetic properties, and it is but feebly toxic. It is valuable for the production of infiltration anæsthesia, but is not so satisfactory when used on mucous membranes, cocaine usually being preferred.

Quinine and urea anæsthesia delays healing of wounds because of the formation by it of a fibrinous exudate in the tissues. Its anæsthetic effects last sometimes for many days.

The use of adrenalin in the proportion of 5 drops of a 1:1000 solution to each 100 ccm. of novocaine solution is sufficient to produce a working anæmia of the most vascular part, causing no pain, no after-hyperæmia, and no interference with wound granulation. It should not be used in tissues where the circulation is disturbed as it may cause necrosis and in plastic work it may interfere with the life of the flaps. Of all local anæsthetics the only ones compatible with adrenalin are cocaine and novocaine. When combined with the holding qualities of adrenalin the ideal solution for local infiltration and conduction anæsthesia is found in novocaine. As much as 900 ccm. of a 0.5 per cent solution and 200 ccm. of a 4 per cent solution have been used in operations.

The symptoms of cocaine or novocaine poisoning are faintness, dizziness, pallor, respiratory disturbances, anxiety, delusions, muscular twitchings, convulsions, and respiratory or cardiac paralysis. There is no direct antidote. The head should be lowered and diffusible respiratory stimulants administered.

Only ill-trained children, nervous persons, and

those whose tissues possess but a low grade of nutrition are unsuitable for local anæsthesia. All minor operations, reduction of dislocations, setting of fractures, and abdominal exploratory operations may be done satisfactorily with this anæsthesia. By infiltration anæsthesia is meant the circumferential injection of sound tissues some distance away, from which the tissues within the field of operation are infiltrated in all directions by means of long needles passed in all directions beneath the skin, supplying the deep tissues first. Syringes of 5 and 10 ccm. capacity and needles from 0.25 to 0.125 mm. in length are required. When used frequently novocaine had best be bought in bulk and 250 ccm. of a 4 per cent solution prepared, dissolving the crystals in normal salt solution, then boiling for ten minutes. Weaker solutions may be made by diluting this with normal salt solution. Adrenalin is to be dissolved and sterilized and added in the proportion of 1 mg. to 200 ccm. of a 0.5 per cent solution, 100 ccm. of a 1 per cent solution, 50 ccm. of a 2 per cent solution, and 25 ccm. of a 4 per cent solution.

E. K. ARMSTRONG.

Macht, D. L., Herman, N. B., and Levy, C. S.: A Quantitative Study of the Analgesia Produced by Opium Alkaloids, Individually and in Combination with Each Other, in Normal Man. *J. Pharmacol. & Exp. Therap.*, 1916, VIII, 1.

In view of the difference of opinion as to the comparative value of the various opium alkaloids in the production of analgesia, it was thought that a scientific analysis of this property would be of value. Heretofore there had been a lack of a quantitative method for the study of pain and this lack the authors have overcome by utilizing the pain sensation excited by the Faradic current of an induction coil, the apparatus employed being a Baltzer inductorium with a vertical sliding secondary coil which was graduated on one side in centimeters and on the other in Kronecker units.

By experiments the threshold for pain sensation for each point in the body selected as convenient for study was demonstrated. The strength of the stimulus required to produce pain having been determined, a narcotic drug was administered and after its absorption the threshold of pain was again determined at intervals and a rise and fall noted, the strength of the stimuli being compared by noting the relation between the primary and secondary in centimeters or by reading the Kronecker scale.

Small doses of morphine (0.005 mg.) produced no measurable analgesia, while 0.01 mg. produced marked lowering of the pain threshold in two of the three subjects but not in the third, who showed hypersensibility to pain. Nausea was marked after morphine and was even felt after the small doses.

The analgesic power of codeine was slight, being far inferior to that of morphine. No nausea or constipation followed its use. The effects of papaverine in 40-mg. doses were not inferior to those of morphine in 10-mg. doses except that the onset of the anal-

grain was slower and its duration shorter. The administration of large doses of narcotine was followed by slight dulling of pain sensation, the injection itself causing considerable pain. Narcotine and thebaine produced no analgesic effect, rather some hypersensibility. Classifying the alkaloids in the order of their efficiency they can be arranged as follows: morphine, papaverine, codeine, narcotine, narcaine, thebaine. Nausea was most marked after morphine, constipation after papaverine and narcotine, and pain from injection after narcotine.

The synergism between morphine and narcotine mesoate, spoken of as "potentiation," was studied. This morphine-narcotine mesoate combination, known as narcophin, 10 mg. of which contains 3 to 4 mg. of morphine, was found to produce nearly as much analgesia as an equal quantity of morphine alone. Even 3 mg. of narcophin, containing less than 1 mg. of morphine and about 3 mg. of narcotine, also produced lowering of the pain threshold, while it was shown that 3 mg. of morphine and 10 mg. of narcotine given alone had no appreciable effect. Narcotine given alone and followed in an hour and a half by a minute dose of morphine illustrated the synergism very distinctly. Less nausea was produced by narcophin than by an equivalent amount of morphine alone, but constipation was more frequent. An interesting observation was that in the subject in whom morphine produced a heightened instead of a lowered pain threshold, this did not occur when narcophin was administered.

Experiments with pantopon or pantopium, a combination of the total alkaloids of opium, 10 mg. of which contained about half its weight of morphine showed that the former possessed greater analgesic powers than half the quantity of morphine alone.

The explanation of the synergism resulting from the combination of morphine and narcotine probably lies in Dierckx's hypothesis that combining two drugs belonging to the same chemical series will result in an addition of their chemical effects, while combinations of drugs belonging to different chemical series are prone to potentiate each other. Morphine is a

representative of the pyridine-phenanthrene group, narcotine of the benzyl-isquinoline group.

K. K. ARMSTRONG

Read, J. S.: Spinal Anesthesia with Stovaine. *N. Y. M. J.*, 1915, 110, 114.

In Read's opinion the main objections to the use of stovaine for spinal anesthesia are:

1. Fear of injury to the spinal cord.
2. Symptoms other than those of analgesia.
3. Uncertainty of anesthesia and difficulties of technique.

He states that in dozens of punctures he has not yet seen permanent injury to the spinal cord.

By the use of Babcock's solution he has seen no symptoms resulting from the injection except headache or dizziness on standing, persisting for two or three days. He says the most common reason for these symptoms developing is the use of either too old or too cold a solution.

In regard to incomplete anesthesia the author states that in only one case out of fifty was anesthesia incomplete. He advises the use of Babcock's solution which is as follows:

Stovaine	0.05
Lactic acid	0.005
Alcohol	0.0
Distilled water	1.8

The needle is introduced slightly to the median line and pushed straight forward. There is a certain "give" when the dura has been punctured. For all urological operations the second or third lumbar interspace is selected.

Read calls attention to the fact that the difference in specific gravity in the solution produces anesthesia at different levels. In nervous patients he recommends the use of one-sixth of a grain of morphine and one-hundredth of a grain of hyoscine.

In an experience with 50 cases no cardiac or respiratory symptoms have occurred. This series includes four prostatectomies. He believes spinal anesthesia to be a safer procedure than general anesthesia.

A. C. STOKES

SURGERY OF THE HEAD AND NECK

HEAD

Lynch, K. M.: An Amoeba in Suppurative and Hyperplastic Osteoperiostitis of Inferior Maxilla. *J. Am. M. Ass.*, 1915, 107, 2077.

Referring to Fleener's report of an amoeba found in cellulitis obtained pus from an abscess on the floor of the oral cavity, and Duffell's observations of a similar amoeba in an abscess with sinuses opening on the right lower jaw, the author gives the history of a case in which his laboratory examination of a rejected left half of a mandible disclosed an amoeba not commonly found in the mouth, differing somewhat from Duffell's parasite and whose mor-

phology renders questionable its classification as dysenteric.

He is unable to pronounce this amoeba the etiologic factor in the lesion, but microscopic examination showed no recognizable bacteria in the pus and animal inoculation gave no results. H. A. POORE

Bonney, C. W.: Carcinoma of the Jaw. *Am. J. Surg.*, 1916, 113, 17.

In a five-years' experience in a hospital service where there was an unusually large number of cases of carcinoma of the jaw, the author concludes that early diagnosis of malignant disease of this region is not made as frequently as it is in some other parts

of the body. This situation is rather extraordinary, as in the oral cavity there is an unusual opportunity to observe these conditions at their very inception. Diagnosis is much simplified when it is remembered that these neoplasms are situated on the epithelial surfaces and that the lesion does not heal kindly after the source of the irritation is removed. If after the application of the simpler remedies, prompt healing does not occur, the lesion is most certainly malignant.

The differential diagnosis between carcinoma of the jaw and syphilis, actinomycosis, epulis, and tuberculosis presents no difficulty. Each condition having its characteristics, a more accurate determination of the actual condition is readily made.

A series of 56 cases is reported, all of which were with one exception in men. In 20 cases the mandible, and in 13 the maxilla, were affected. While in the entire series the results were not extraordinary, there were in the series, 10 cases in which the primary operation was undertaken with very good results. As these were a general run of cases in a hospital, it is expected that in private cases the end-results would be much better.

The operative technique shows the removal *en masse* of all involved structures. Preliminary ligation of the external carotid is practiced and no harmful results have occurred. A careful light ether anaesthesia is the anesthetic of choice. H. P. KERN.

Fisher, A. R.: Chloramine in the Treatment of Wounds of the Mouth and Jaws. *Brit. M. J.*, 1916, 1, 87.

Fisher, Staff Surgeon British Royal Navy, reports his use of chloramine (chemically toluene sodium sulphochloramide) as a new antiseptic agent for the irrigation and lavage of septic wounds. The history of seven cases of gunshot wounds involving the mouth is given, these wounds being by their nature and location highly septic. A two per cent aqueous solution was employed. According to the character of the wound, hourly irrigation through drainage tubes, or frequent gargling or mouthwashing, with the solution was practiced. He asserts that chloramine is a powerful, penetrative antiseptic, is not neutralized by albuminous discharges so readily as are the simpler chemical antiseptics, and is bland, pleasant, and non-irritant.

In all cases, either the wound was maintained cleanly or suppuration quickly stopped. The tongue and breath were clear and repair was rapid. H. A. PORTS.

Dolamore, W. H.: Prevention of Deformity Following Fracture or Resection of the Jaw; a Plea for the Use of Splints. *Brit. J. Surg.*, 1916, 3, 520.

Dolamore gives an account of his experience in the treatment of fractures and injuries of the jaw-bone. He divides his cases into two classes: (1) those where the jaw is fractured but no bone is lost; (2) where injury is accompanied by destruction of the

bone and soft tissues. The treatment in both cases has this in common: that the portions of the jaw must be kept in their correct positions so that afterward the teeth may articulate properly with their opposites.

A general review is given of all the mandibular splints and the conclusion reached that the metal-cap splint is the best in fractures of the mandible. This splint is made of thin metal, pressed out to conform to the shape of the teeth, from a cast taken with the fragments of the jaw-bone in good position. This cast is then cemented to the teeth. Two lateral processes project from the mouth, curving down to the sides of the jaw. These may be joined by a bandage passing underneath the chin. In simple fractures of the jaw-bone, or where there has been lack of bone, this splint meets the requirements best, in that it keeps the fragments in position, allows the patient to eat, and is easier kept clean than any other splint so far devised. In case the patient is without teeth in the lower jaw, wire attachments are soldered to the splint, which rests at the back portion on the gum. This lower splint fits into a vulcanite plate made from a plate of the upper jaw. Various devices are detailed which meet the requirements of the injuries sustained as the result of gunshot wounds, when bone and bits of tissue are lacking.

Special stress is laid on the importance of artificial means of support being used immediately after operation, or injury, to fill out the defect by a mechanical appliance so that the normal contour of the features may be preserved, and secondary cicatricial contraction avoided.

After several months the tendency to scar-tissue contraction lessens, so that it is of material benefit to the surgeon in estimating the size of the flaps at a second operation to correct the cosmetic appearance.

H. G. SLOAN.

Taylor, J. H.: Consideration of a Basal Fracture of the Skull. *Internat. J. Surg.*, 1916, xxviii, 414.

The author urges a decompression operation in all doubtful cases of head injury, for the reason that the signs of increased pressure from hemorrhages oftentimes do not occur until late. He cites a case in point.

HENRY J. VAN DEN BERG.

Davis, E. D.: Fractured Skull with Healed Attic Suppuration of an Unusual Type. *Proc. Roy. Soc. Med.*, 1915, 18, Otol. Sect., 4.

The patient, an engineer, aged 42, complained of deafness after a crushing injury to the head in which the vertex of the skull was fractured and an operation for depressed fracture was performed. At the time of the accident there was hemorrhage from both ears. The left ear showed extensive and healed attic suppuration, revealing a cavity of considerable size above and behind the tympanum. The deafness was of the middle-ear type and there was no history of deafness or of ear disease prior to the accident.

OTTO M. ROSE.

Beasley, F. A.: A Contribution to the Subject of Skull Fractures; Analysis of 1,000 Cases at the Cook County Hospital and a Report of 74 Cases Examined at Necropsy. *J. Am. M. Ass.*, 1916, vol. 343.

A careful study of seventy-four cases of fracture of the skull at necropsy has convinced the author that the fractures of the base are not produced by a bursting force, but are due to a direct insubending force applied through the articulation of the condyles and atlas. It has been observed repeatedly that the fractures occupy the same position and are of about the same extent, regardless of location of the injury on the vault. The thinness of the skull through the middle fossa accounts for the frequent fracture at those sites. In all the examinations, a fracture of the posterior or occipital fossa that was not a direct continuation of a fracture of the vault was not observed. There were 17 such cases in the series of 74.

A fracture of the insubending type produces more extensive separation of the inner table, which fact can be illustrated by the break on the convex surface of a green stick. When the cranial fracture is produced by a high-powered bullet at a close range, a hydrodynamic force enters in, resulting in a sudden expansion of the brain tissue. When a modern jacket bullet is fired at close range, a complete shattering of the cranial structures may occur. If a skull be fractured by a bullet, it is possible to distinguish between the wound of entrance and the wound of exit. The table which is last penetrated by the missile shows the greater amount of radiating fracture.

In compound fractures of the base, little can be accomplished in the way of prevention of infection. In compound fractures of the vault, infection can be combated to a material extent.

These 1,000 cases show that 184 patients received their injury by falling from a height and 311 were struck on the head; 38 cases were due to gunshots; the cause of injury of 267 cases was not recorded.

The age of the patients varied within wide limits, the youngest being 3 hours old and the oldest 81 years. A large majority (68.7 per cent) were between the ages of 20 and 50.

Blood and spinal fluid from the ears occurred in 116 cases, bleeding from the right ear in 111, from the left ear in 146, and not stated in 18. Free bleeding from the orbital cavity occurred in 10 cases. Unmixed cerebrospinal fluid from the ears occurred in 1 per cent, or in 21 cases. It came from both ears in 3 cases, from the left in 11 cases, and from the right in 7 cases. Free bleeding occurred from the mouth and nose in 111 cases, from the nose in 113 cases and from the mouth alone in 33 cases, or a total of 343. In the fatal cases of all types the respiration average was consistently higher.

The patellar reflexes were increased in 67 cases, absent in 30 cases, with no change recorded in the others.

A Babinski reflex was observed in 33 cases and a Kernig sign in 8 cases. General convulsions were noted in 32 cases. Clonic convulsions of the arm occurred in 6 cases, of the leg in 2 cases, and of the face in 7 cases.

Rigidity of the legs was observed in 20 cases and of the neck in 20 cases. Complete muscular paralysis was observed in the muscles of the face in 47 cases, in the muscles of the legs in 55 cases, and in the muscles of the arms in 58 cases.

In the series of 1,000 cases, vomiting was a common symptom and occurred in 361, or 36 per cent of all cases. In 11 cases the vomitus was almost wholly blood.

EDWARD L. CORRELL.

Chapman, V. A.: Osteoma of the Frontal Sinus. *J. Mich. St. M. Soc.*, 1915, xiv, 18.

The author reports a case with operation, the patient having no recurrence after six years. The tumor, of ivory consistence, measured 59 mm. x 40 mm. x 30 mm., and weighed a little less than two ounces. The tumor nested in the right frontal sinus and extended to nearly one inch past the middle line. There was a small perforation in the anterior long wall. All of the anterior table of skull over the cavity occupied by the tumor was removed and the soft parts replaced against the posterior table to prevent any retention pocket.

OTTO M. ROFF.

Zange: Translabirinthine Operation for Tumors of the Acoustic Nerve and the Pontocerebellar Angle. (Translabirinthäre Operationen von Acusticus- und Kleinhirnstumoren.) *Ber. Klin. Wchnsch.*, 1915, li, 1334.

Tumors of the pontocerebellar angle and those of the acoustic nerve itself in this region have hitherto been operated upon exclusively by Krause's method. The first stage of this operation consists in cutting a flap of bone over the half of the cerebellum involved, and the second of incision of the dura of the cerebellum, avoiding the sinus and tentorium, laying bare the cerebellum. It is very dangerous and has a mortality of 70 to 80 per cent. The danger lies in the sudden removal of pressure in the posterior fossa when the bone flap is laid back, and in contusions and circulatory disturbances when the cerebellum is moved aside to get at the acoustic and the pontocerebellar angle. These frequently result in death from shock, and paralysis of heart and respiration which may occur during the operation or within forty-eight hours after it. There is also danger of serious hemorrhage. Improvements in diagnostic methods in recent years have enabled the operator to distinguish between tumors of the acoustic and those of the pontocerebellar angle not involving the acoustic. In the tumors of the acoustic a less dangerous method of operation has been devised than Krause's. This was first proposed by Pansse in 1904 but has only recently been used.

In the translabirinthine operation the petrous portion of the temporal bone, including the apex is chiseled away, even around the carotid, and by

pushing aside the temporal lobe, which is thus laid bare, free access is given to the acoustic nerve and the pontocerebellar angle. The decrease in pressure of the posterior fossa takes place gradually, and the whole operation is extradural. Therefore there is no danger of secondary infection, and there is no necessity for displacing or pulling upon the cerebellum. The operation has been performed four times on extradural tumors of the acoustic, in 1912 one case each by Quix and Kuemmell and in 1915 two cases by Schmiegelow. But it can be performed even when the tumor extends inside the dura into the pontocerebellar angle, even when it is as large as a hen's egg, as is shown by the case demonstrated by the author in which a neuroblastoma as large as a hen's egg was successfully removed after the whole of the petrous portion had been chiseled away. The translabyrinthine method is to be preferred in all cases of true acoustic tumors.

In the discussion WREDE held that the advisability of the translabyrinthine operation depended on the size of the tumor, and this could not be determined in advance. Moreover it destroys the hearing, which may return after the Krause operation.

Stock said that all the cases he had operated upon by Krause's method had died.

Zange replied that the size of the tumor could be determined clinically. In true acoustic tumors the hearing is destroyed anyway. In cases where the hearing is only affected by pressure of a tumor not involving the acoustic itself the Krause operation is indicated.

A. Goss.

Schloss, O. M., and Schroeder, L. C.: Nature and Quantitative Determination of the Reducing Substance in Normal and Pathologic Cerebrospinal Fluid. *Am. J. Dis. Child.*, 1916, xi, 1.

The reducing substance in cerebrospinal fluid is a fermentable, dextrorotatory sugar, probably dextrose.

In infants and children free from meningeal disease, the cerebrospinal fluid sugar ranges from 0.05 to 0.134 per cent (dextrose), approximately the same figures which obtained for blood sugar.

There is no decrease in the reducing power of the cerebrospinal fluid in meningism.

A large proportion of the cases of tuberculous meningitis show a decrease in the sugar content of the cerebrospinal fluid at some stage of the disease. In a few cases, however, the sugar is normal at all times or diminished but slightly. A decrease only is of diagnostic value.

EDWARD L. CORNELL.

Watanabe, W. K., and Crawford, A. C.: Does the Pituitary Gland Contain Epinephrin or a Compound Similar to It? *J. Pharmacol. & Exp. Therap.*, 1916, viii, 75.

As epinephrin is the most active pressor substance known to occur in the animal organism, it would be logical to infer that pituitary extracts owe their blood-pressure raising effect to an action on the suprarenal glands or that epinephrin itself, or a similar com-

pound, occurs in the pituitary gland. However occlusion of the suprarenal circulation does not diminish the pressor effect of pituitary extracts, and arguments indicating the absence of epinephrin in pituitary extracts only hold good providing such extracts represent a single pure compound. But it has been shown that in pituitary extracts there must be one or two depressor compounds and one or more pressor compounds along with colloids. Watanabe and Crawford are convinced that epinephrin, or a similar compound, is responsible for much of the pressor action of the pituitary, modified by the presence of one or more active compounds along with colloids. Epinephrin has not yet been isolated from these glands and this may be due to the small amount present.

The experimental work conducted by these observers may be summarized as follows:

1. Pituitary extracts prepared by certain methods give color reactions similar to those given by suprarenal extracts.

2. Slowing of the heart-rate in the dog was seen to result from the use of a preparation in which no pressor action was detected.

3. Pituitary extracts cause a strong contraction of non-pregnant cats' uteri, and this is not changed by the addition of certain amounts of epinephrin.

4. After ergotoxin injection, pituitary extract causes a lowering of blood-pressure as by epinephrin, suggesting that some of the pituitary action is on the sympathetic nerve terminals.

5. Isolated loops of rabbits' and cats' intestines are strongly contracted by pituitary extract and are not relaxed by the addition of certain amounts of epinephrin to such extracts.

6. By oxidation with MnO_2 , pituitary extracts lose their pressor action and some of their color reactions, but retain to some extent their action for both non-pregnant cats' uteri and intestines.

7. Several methods for isolation of epinephrin were tried on the pituitary glands, but unsuccessfully, possibly because of the small amounts present.

E. K. ARMSTRONG.

NECK

Coley, W. B.: Primary Neoplasms of the Lymphatic Glands Including Hodgkin's Disease. *Ann. Surg.*, Phila., 1916, lxi, 35.

The author attempts in this paper to add some further clinical data bearing upon primary tumors of the lymphatic glands, on the basis of a study of 167 cases which he has personally observed. He is impressed by the fact that it is difficult, or many times impossible, to make a correct diagnosis by clinical means and that it is very often necessary to remove a gland for diagnostic purposes before treatment is undertaken.

Coley believes that there is much evidence pointing to very close relationship between the group of tumors at present designated as malignant tumors — sarcoma and carcinoma — and the group re-

garded as Hodgkin's disease. He believes that the best results may be expected by the proper use of the toxins, either alone or in conjunction with the X-rays or radium.

GEORGE E. BIELBY.

Freeman, J. K.: Hyperthyroidism Associated with Gynecomastia. *Therap. Gaz.*, 1916, 31, 9.

So far as the author has been able to ascertain, the condition of gynecomastia associated with hyperthyroidism has never before been reported. His case was a man, 37 years old, married, father of four children. A sister aged 30 has goiter, and a daughter developed enlargement of the gland at 13. The complaints for which the patient sought relief when first seen were nervousness and general weakness which were so pronounced that he could not attend to his work of harness making. The findings were those of a typical case of hyperthyroidism, and the patient responded favorably to the proper medical handling of the case. Three months after the onset of nervous symptoms, a distinct enlargement of both mammae was noted with the formation of large, pigmented areolae. The author does not state definitely when the hypertrophy of the mammae occurred. A brief review of recent literature on hyperthyroidism and a rather extensive review of the literature upon gynecomastia are given.

E. FISCHEL.

Marine, D., and Peiss, H. O.: The Absorption of Potassium Iodide by Perfused Thyroid Glands and Some of the Factors Modifying It. *J. Pharmacol. & Exp. Therap.*, 1916, vii, 117.

In this study the authors attempt to answer the question as to whether or not the surviving thyroid cells *in vitro* have a specific affinity for iodine. They chose the method of perfusion because of its simplicity and because similar operations can be carried out *in vivo*. In all of these experiments the thyroids, kidneys, and spleens of dogs were used, because the canine thyroids of dogs, the authors believe, are the most easily perfused of all organs under conditions at all physiological. The method of perfusion was primarily utilized to ascertain whether salts of iodine were held in the surviving gland in quantities far greater than in other surviving tissues similarly treated, and if this was true, whether one could not partially involute actively hyperplastic glands *in vitro*, as invariably happens *in vivo*—the changes in the living animal's thyroid being recognizable in from 46 to 48 hours. The authors demonstrated the former, but the latter involved the grave difficulties of maintaining nutrition and of getting rid of products of metabolism. The technical and aseptic problems were readily overcome. They believe that eventually it will be possible to partially involute an actively hyperplastic gland by some such method.

The question of the absorption of other salts than iodine, as for example bromides, arsenic, etc., has not been investigated. It is known that following the administration of bromides the thyroid retains a

part temporarily, but it produces none of the effects or activities of iodine.

The authors' experiments indicate that the elaboration of iodothyroglobulin is a slow and probably complex process, and it is hoped that further study will lead to a definite conception of the minimum interval of time required for its production. Such knowledge for the iodine protein combination might be applicable to other protein compounds within organic substances whose chemical nature and function are little understood.

The authors summarize the results of their experiments as follows:

1. Artificially perfused thyroids take up and retain potassium iodide to the same extent that *in vivo* perfused thyroids do.
2. This characteristic is not shared by the liver, kidney, spleen, or muscle.
3. The amount of potassium iodide retained is independent of its concentration in the perfusion fluid.
4. Only surviving glands exhibit the ability of taking up potassium iodide.
5. Potassium cyanide inhibits this activity of the thyroid.
6. It is possible to wash out with deoxygenated blood a very small amount of the iodothyroglobulin in an hour's perfusion even in intact glands rich in iodothyroglobulin.
7. Autolyzing glands do not take up potassium iodide and rapidly give up their stored iodine to the perfusate.
8. The potassium iodide stored in a thyroid gland forms one hour's perfusion, whether *in vivo* or *in vitro*, is pharmacologically inactive.

Wilson, L. B., and Kendall, E. C.: The Relationship of the Pathological Histology and the Iodine Compounds of the Human Thyroid. *J. M. Sc.*, 1916, ch. 79.

The data herein presented furnishes additional proof of the statements previously made by Wilson that the symptom-complex which is generally recognized as typical Graves' disease, exophthalmic goiter, is constantly parallel in all its stages of development and regression with similar stages of development and regression in the parenchyma of the thyroid. This parallelism is shown in the average duration of goiter, the average duration of toxic symptoms, and in the progressive and regressive histological changes. Now, for the first time in detail the percentages and total amounts of iodine, the pathological groups, and the clinical types have been compared in the same series of cases.

The authors have shown that iodine in the glands exists in two independent forms of combination, only one of which is toxic. One fact running through all the tables is that the amount of iodine in the gland parallels the clinical grouping. In the actively hyperplastic glands it has been shown that the amounts of iodine and α -iodine are very low, but in cases where regression has occurred the amounts of

iodine are high. In contrast to this it was found that the amount of iodine in the non-hyperplastic toxic glands is higher than in the non-hyperplastic atoxic glands.

GEORGE E. BEILBY.

Pool, E. H., and Falk, H. C.: Concerning the Surgical Anatomy of the Thyroid with Special Reference to the Parathyroid Glands. *Ann. Surg.*, Phila., 1916, LXXI, 71.

This paper deals with certain essential anatomical details which have direct bearing upon the operation of excision of the lateral lobe of the thyroid gland, particularly the relationship of the surgical capsule, the parathyroid glands, and the recurrent laryngeal nerve to the posterior part of the lobe. The authors have endeavored particularly to determine whether the theoretical advantages of leaving a portion of the posterior part of the lobe, that is, the part in relation with the recurrent laryngeal nerve and the parathyroid bodies, have sufficient anatomical basis to outweigh the practical disadvantages of the procedure. With this object in view an effort has been made to trace the course and to establish the relations of the surgical capsule in the posterior region of the lobe and to determine the relationship of the parathyroids and the recurrent laryngeal nerve to this fascia and to the thyroid itself. The authors are led to make the following deductions:

Since two parathyroids usually lie on each side, and inasmuch as two parathyroids apparently can satisfy the demands of the body, the chance that tetany will develop as a result of extirpation of one lobe is extremely remote. It is reasonably safe, therefore, as far as tetany is concerned, to perform complete intracapsular extirpation of one lobe, as is so often done, for instance, in exophthalmic goiter.

In regard to safeguarding the recurrent nerve it may be emphasized again that in a true intracapsular extirpation of a lobe the recurrent nerve is relatively immune from injury. Nevertheless as has been explained the capsule may be torn at its posterior

part and the cellular plane which contains the recurrent may be entered and the nerve injured. This danger is avoided by leaving a portion of the posterior part of the lobe.

It is advantageous, but not imperative, to leave *in situ* the posterior parts of both lateral lobes in relation with each of which a recurrent laryngeal nerve and two parathyroids usually lie. Complete bilateral extirpation, the isthmus only being left, should never be considered. The posterior part of one lobe must always be left. GEORGE E. BEILBY.

Freeman, L.: Further Experience with the Use of the Wire Tourniquet in Partial Thyroidectomy. *Am. J. Surg.*, 1916, XXX, 8.

Freeman describes a method for the temporary control of hæmorrhage during operations upon the thyroid. This consists in applying on either side of the lobe to be removed, after it is delivered from the wound, two stiff pieces of wire which are bound together with strong cord. After the removal of such a portion of the gland as is necessary and suturing is completed, the wires are removed.

The advantages claimed for this method are:

1. It is easily and rapidly applied, requiring no particular skill in its adjustment and saving considerable time.
2. It effectually controls all hæmorrhage, thus obviating the necessity for crowding the field with hæmostatic forceps.
3. It does away with danger to either the recurrent laryngeal nerves or the parathyroid bodies, because it is applied at a safe distance from them, and even if they should by any chance be caught, the pressure is not great enough to permanently injure them.
4. It compresses the goiter without crushing it, which is of importance in Graves' disease at least.
5. Because the loops pass through the tissue the wires are prevented from slipping during the course of the resection irrespective of the size of the remaining stump.

GEORGE E. BEILBY

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Martin, G. F.: Some Phases of the Surgery of the Chest Cavity. *N. Eng. M. Gaz.*, 1916, L, 27.

Pleural effusion usually clears up promptly after aspiration, but if pus is present, free drainage is indicated. In draining an empyema the tubes must be placed in the most dependent position and should be securely fastened lest they slip into the pleural cavity. The majority of cases recover under this treatment, but when they fail to close the problem becomes much more difficult. The pleura becomes thick and unyielding, its two surfaces remaining separated and a permanent pus-secreting cavity results. The two measures of greatest value in

overcoming this condition are the Estlander operation and decortication of the lung. The objections to the former are the great deformity of the chest wall and the spinal column. Decortication aims to restore the parts to a normal condition.

Decortication, by removing the abnormal thickened lung covering, allows the collapsed lung to expand. In the first case operated upon by the author an Estlander operation was done for the relief of an old-standing empyema cavity, but without permanent benefit. The chest was again opened, the lung found rolled up in a ball at the apex of the cavity and the pleura was more than an inch in thickness. The adhesions of the latter to the vertebral column and ribs were divided one by

one and the lung allowed to expand until it almost filled the whole cavity. This was accompanied by severe hemorrhage and shock, but recovery was complete and was accompanied by very considerable regeneration of the ribs over the field of operation, as the peritoneum was not removed. A second case also made a complete recovery. Neither were operated upon under differential pressure. The room temperature must not be below 84° in work of this kind.

F. K. ARMSTRONG.

Pryor, J. H.: Some Puzzling Features of Empyema.

N. Y. M. J., 1930, 110, 125.

The symptomatology of empyema in the child may be quite misleading at times. The sudden onset and the appearance of symptoms similar to those manifested in pneumothorax must be borne in mind. Physical signs in children are frequently remarkably modified in comparison with those found in the same condition in the adult.

The author had five cases of empyema associated with subdiaphragmatic abscess. The subdiaphragmatic abscess was usually neglected and only opened up later when the symptoms were not relieved by drainage of the pleural cavity. In all of these cases there was tenderness over the upper half of the abdomen with muscular rigidity and resistance to pressure. Pain could be caused by pushing up against the diaphragm.

Hiccupping makes one suspicious of this condition. The diagnosis may be made by noting the difference as seen in pleural effusion, where there is a change of percussion sound during deep inspiration after altering the position of the child, by observing the absence of percussion sound modified by position. The breath sounds and conduction of sounds through a large accumulation of fluid may be most deceptive when considered alone.

Pryor draws the following conclusions deduced from these cases:

1. Exclude other conditions, particularly pneumonia.
2. Remember the possibility of associated pneumonia.
3. Always compare the two sides of the chest.
4. Always make use of the change of position and mark the altered levels of the fluid.

Aspiration with a needle is the best check in cases of suspected empyema. It is well to see that the needles are quite sharp and to have the child's body bent away from the operator with his arm on that side thrown up over his head in order to increase the space between the ribs, so that the needle will not come in contact with them when the puncture is made. Children usually complain of the needle puncture in using novocaine as much as they do when the puncture is made without any preliminary blocking. In case the puncture is made high, the character of the exudate may be misjudged. Seropurulent fluid may be found in the upper chest while the exudate is quite thick and cheesy below.

If the rib resection is made too high in the chest, an encapsulated mass may remain at the place where the diaphragm is reflected from the chest wall.

Symptoms of profound toxemia, such as rapid breathing, high fever, and disturbed heart action are often due to the association of a pericarditis. Death in these cases is usually caused by septic endocarditis, alone or combined with pericarditis. The prognosis is grave in this type of cases.

During childhood the drainage tube can be dispensed with quicker than in the case of the adult. It is wise to begin deep-breathing exercises early in order to have the lung become entirely normal again.

Recurring empyema and undetected pockets of pus are very trying. The fluoroscopic screen is one of the greatest help in their detection.

As in the child, the diagnosis of empyema in the adult must be made early and prompt relief given if a comparatively good result is expected, otherwise the patient will be left with a partially disabled lung for the remainder of his life.

The author thinks that the rapid breathing in most cases is referable to toxemia and the involvement of the pericardium or diaphragm rather than to the size of the effusion. Encapsulated abscesses between the lobules of the lung are most readily diagnosed by the aid of the puncture needle with the fluoroscopic screen. In case the X-ray is not available, dependence will have to be placed on fine changes in breath sounds and pitch of the tone. Cough must be employed to bring out adventitious sounds.

There are detailed several cases of recurrent empyemas and the individual discussion of the cases is taken up. From these the author derives the following conclusions:

1. Vastly thickened adhesions causing the obscuration or absence of physical signs, make the diagnosis difficult. In shaking the patient when under observation by means of the fluoroscopic screen fluid waves may be detected in the pus of the abscess. There is great danger of pleural hemorrhage from the thickened adhesions in operating on such cases. In case hemorrhage is encountered it is wise to compress the chest with a rubber bandage.
2. Resection of one or more ribs may be of material help in exploring as well as giving free drainage. The greatest number of these pockets of pus are located in the lower half of the chest. The same trouble from subdiaphragmatic abscess is encountered in the adult as in the child. Drainage tubes in contact with the diaphragm often cause much pain to the patient.

3. Attention is drawn to the fact that infarcts of the lung not infrequently follow surgical operations of the upper right abdominal quadrant. These may lead to lung abscesses.

The author believes that tuberculous empyema where there is no secondary infection ought to be aspirated only. When a rib is taken out in these cases the cavity very rarely closes. He quotes

A. H. Garvin's treatment which consists of washing out through two needles with large amounts of saline, and thinks the results are much better than in resecting the rib.

By early diagnosis carnification and atelectasis may be avoided as a result of early interference. In case the effusion is not evacuated the lung may not only fail to expand fully, but the diaphragm on that side is also flattened and tends to lose its power of contraction, probably through the neuromuscular mechanism, rather than the varying pressure conditions it is exposed to. H. G. SLOAN.

Gerding, L.: Parapneumonic Empyema. *Am. J. Dis. Child.*, 1916, xi, 33.

In a series of 15 cases of typical lobar pneumonia or bronchopneumonia in children under four years of age, seen in the Children's Memorial Hospital, exploratory punctures of the chest were made as early as possible in the course of the disease. The needle was put in over the area of greatest impairment as shown by physical signs and roentgenograms. In only one of the cases where fluid was not found at the first puncture were subsequent trials made, and no fluid was found until the twenty-second day, when a typical metapneumonic empyema was found.

In 6 of these 15 cases (40 per cent) fluid was recovered by puncture before the seventh day of the disease, always before the crisis. Five of the six fluids were opaque and yielded a large clot. They contained a large number of cells, between 70 and 80 per cent polymorphonuclear leucocytes. No micro-organisms could be demonstrated in them by smears. Cultures on agar, milk, bouillon, and some on blood-agar, gave no growths. Inoculations into mice produced no harmful results, except in one case in which the mouse died within twenty-four hours, but no lesions were found and no organisms could be grown from its heart's blood or serous cavities. In all 5 cases the fluids were absorbed spontaneously, as was shown by later punctures and roentgenograms. The clinical course of the disease was never noticeably affected by the presence of these fluids.

Although the literature on this subject seems large, the actual number of cases with sufficient description of the fluid found is too small for very definite deductions. However, the author puts forward tentatively the following conclusions:

1. Fluid is present in the pleural cavity in a large number of cases of pneumonia before the crisis and can be demonstrated, sometimes by physical signs, sometimes by roentgen ray, and sometimes by puncture, even when other physical signs are not apparent.

2. The clinical course of the pneumonia may not be altered by this complication.

3. In the majority of cases the fluid is serofibrinous in character, though perhaps containing a large cellular element, polymorphonuclear in type. These fluids are sterile as a rule.

4. True pus is present much more rarely and may contain organisms of more or less virulence. The frequency of the presence of organisms in these cases cannot be decided on the data as yet secured.

5. The virulence of the isolated organisms determined by animal inoculation seems to be of value in prognosis.

6. Only in cases with serofibrinous and purulent fluids containing organisms of a high grade of virulence should surgical interference be considered.

EDWARD L. CORNELL.

HEART AND VASCULAR SYSTEM

Yates, W. N.: Injury with Extravasation of Blood in the Pericardium. *J. Mo. St. M. Ass.*, 1916, xiii, 29.

A farmer, aged 46, was thrown from his wagon and sustained several cuts and bruises about the body, but the most serious injury was to the left chest wall. The fourth and fifth ribs on the left side near the anterior axillary line were fractured. There was a bulging of the chest wall just outside the sternum and a corresponding depression of the chest wall in the axillary region. There were pronounced shock and intense pain in the left side of the chest, greatly intensified at every attempt at movement.

During the following night there had developed with each cardiac impulse a well-pronounced splashing or succussion sound. It was synchronous with the systole and loudest just above the apex beat. This sound was loud enough to be distinctly audible all over the room. It was interpreted to signify that there had been a puncture of both lung tissue and the pericardial sac by the end of a broken rib, resulting in an effusion of both blood and air in the pericardium. The patient's condition was grave for some ten days or two weeks, his temperature ranging from 100 to 103° F., pulse 110 to 125 or 130, accompanied by much suffering, dyspnoea, and marked sweating. The abnormal sound persisted for two weeks. The dyspnoea and other untoward symptoms slowly subsided and at the end of three weeks his pulse and temperature were normal and he was able to be up and about the ward.

EDWARD L. CORNELL.

PHARYNX AND OESOPHAGUS

Moorehead, R. L.: Post-typhoid Ulceration and Stricture of the Oesophagus. *Laryngoscope*, 1915, xxv, 848.

The author reviews the cases reported in the literature and adds a report of his own cases.

Of the 17 cases of post-typhoid stricture on record, 2 occurred in females, the remainder being in males under 36 years of age. The time of the development of the difficulty in swallowing varied from the second to the twelfth week after the onset of the fever, but was most often noted about the

fourth week. Only two of the cases showed any stricture formation in the upper part of the esophagus, and in both of these cases strictures were also found in the lower end.

Factors favoring the formation of ulcers are: (1) a low grade inflammation from which the whole of the digestive tract suffers, and (2) the local stasis of blood which is increased by gravity. The majority of the cases had noticed difficulty in swallowing during convalescence from typhoid or even later. Hematemesis and pain in the epigastrium were not noted, but these as well as dysphagia have

been noted where no ulceration of the esophagus existed; consequently there are no classical symptoms by which this condition can be diagnosed.

In the series reviewed, gastrostomy was performed upon 6 cases with one death; 3 were dilated with bougies with one death; and 3 died, apparently without either operation or dilatation. These cases all occurred before the perfection of esophagy, and the author points out that at the present time the mortality should be practically nil, and if the patients are seen before severe starvation develops gastrostomy will be unnecessary. OTTO M. ROFF.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Reider, F.: Technique for Making the Suprapubic "Stab Wound." *J. Am. M. Ass.*, 1916, lxxi, 272.

In using that efficient method of draining the abdominal cavity, the suprapubic "stab wound," care must be taken to avoid injury to the underlying organs or to the directing finger and peeling off of the parietal peritoneum at the point where the knife is to penetrate. To obviate these dangers it is advised that a ball forceps, made by fusing a ball of soft metal on the end of a 12-inch pedicle forceps be used. The ball should be the size of a marble and divided so that the forceps may be opened. It is introduced through the abdominal wound and pressed against the abdominal wall. An incision is made down to it; it is then pressed into the wound and opened sufficiently so that a drainage tube may be grasped and drawn into the abdominal cavity. E. K. ARMSTRONG.

Gatewood: A Strangulated Epigastric Hernia. *J. Am. M. Ass.*, 1916, lxxi, 82.

The frequency of hernias occurring in the linea alba between the ensiform cartilage and the umbilicus varies when compared with the frequency of other hernias from 0.19 per cent to 1.37 per cent, according to the statistician. Of the various types usually described the least common is that which contains omentum and intestine. Strangulation of epigastric hernias is exceptionally rare, only 11 cases having been thus far reported, and of these only 5 contained omentum and bowel. To these Gatewood adds one case as follows:

This hernia, which was diagnosed prior to operation, occurred in a man who had been injured some years before by a wagon passing over him. The strangulation had occurred three days prior to his admission to the hospital. Immediate operation was performed under local (novocaine) anesthesia, and four inches of small bowel together with some adherent omentum found. Closure was made by incision of the abdominal wall from above downward (Mayo method), and the patient made a complete recovery. GATEWOOD.

Balfour, D. C.: Non-strangulated Diaphragmatic Hernia Due to Indirect Injury. *Ann. Surg.*, Phila., 1916, lxxi, 78.

Diaphragmatic hernia is a condition sufficiently rare to justify the report of all cases and especially those successfully operated upon. Balfour's case is especially interesting because of the history and the operative procedure undertaken for the cure of the condition. The patient was a railroad conductor 47 years of age who, four years previous to examination, had sustained a very violent crushing injury from falling logs. From the time of the accident he had had unabated burning and pain at times increasing to a colic which began in the epigastrium and radiated into the left chest. There was marked dyspnea after the accident and he could not lie down in bed. He was frequently aware of rumbling and gurgling in the left chest. Cathartics was always necessary to move the bowels. Physical examination showed the heart in the midline; under forced respiration splashing sounds of fluid and air were heard in the left thorax as high as the nipple and to the left of the apex. Other signs were strongly suggestive of fluid and air in the left pleural sac. The roentgenogram showed the stomach high in the left thorax, distorted, and slightly rotated. The colon occupied the upper part of the left thoracic cavity, the splenic flexure being above the sternoclavicular junction. In discussing differential diagnosis, the author states that the most important evidences of hernia are: (1) destruction of the definite dome shape of the diaphragm; (2) the appearance of lung tissue through the gas bubble in the left chest; (3) the demonstration of hemothorax in the colon above the level of the bowline in the chest.

Operation was performed under intratracheal ether anesthesia with the patient in a moderate reversed Trendelenburg position. The incision was along the outer border of the left rectus muscle to the rib margin and from there along the margin towards the midline. Several feet of jejunum, the stomach, the colon, and the spleen were in the thoracic cavity and were with great difficulty brought down into the abdomen since each inspiration drew them up into the thorax. The hernial opening

was seen to occupy about the center of the left dome of the diaphragm, its greatest diameter was antero-posterior and its average seven inches. The edges were thickened and rounded and were not "freshened" for closing. After the application of coaptation forceps, the opening was closed in the antero-posterior direction for two-thirds of the distance; then the most distant edge of the opening was picked up and the closure was completed in a direction at right angles to the beginning. Number 3 catgut continuous suture reinforced by interrupted silk was used in the closure, and was satisfactory in every way.

There was a subacute intestinal obstruction three weeks after the operation due to an adherent loop of intestine to the line of incision, but after this was relieved the patient made a perfect recovery with all the abdominal organs in proper place as shown by roentgen examination before the patient left the hospital.

An interesting feature of the operative findings was the finding of two ulcers, one on the lesser curvature of the stomach, the other on its posterior wall, both of which the author suggests were possibly due to the abnormal position of the stomach in the thorax.

In a short discussion as to the relative merits of the transthoracic, abdominal, and combined abdominal-thoracic routes the author believes that the possibility of complicating lesions to abdominal viscera makes the abdominal route the one of preference.

E. FISCHER.

GASTRO-INTESTINAL TRACT

Boehler: Hopeless Prognosis of Gastro-Intestinal Wounds Without Operation (Die Prognose der Magendarmverletzungen ist ohne Operation absolut schlecht). *Med. Klin.*, Berl., 1915, xi, 1232.

Boehler was a believer in the conservative treatment of abdominal injuries at the beginning of the war, but after having treated over 300 penetrating wounds of the abdomen he is convinced that cases in which the stomach or intestine is injured practically never recover without operation. The favorable statistics from conservative treatment result from the fact that all sorts of abdominal injuries are classified together, while in a considerable percentage of them the intestinal tract has not been injured. Such wounds recover quite readily under conservative treatment. It is quite possible for bullets to pass between the loops of intestine without injuring them. It is not always possible to make a differential diagnosis between intestinal injury and internal hemorrhage, but both demand laparotomy.

Cases of intestinal injury should have a compression bandage put on and should be transported as rapidly as possible to the nearest hospital for operation. Operation should be performed within the first ten hours if possible. Small openings may be sutured, but if they are large or there are numerous

wounds in the intestine or if the mesentery is torn resection should be performed. When performed in time operation on intestinal injuries is perhaps the most hopeful field in military surgery, for the patients are completely normal after the operation, while in head surgery, for example, there are very apt to be mental or psychic defects following the operation.

A. Goss.

McGlannan, A.: Linitis Plastica Hypertrophica (Leather Bottle Stomach); Report of a Case. *J. Am. M. Ass.*, 1916, lxi, 92.

The author discusses the condition and reports the following case:

The patient, a white woman, aged 22, had a previous history of typhoid fever ten years ago. The onset of the present illness was abrupt, twenty days previous. The initial symptom was vomiting, which continued daily, with acrid eructations occurring almost constantly. There were slight pain in the abdomen and marked constipation. There was a progressive loss of weight.

The patient was greatly emaciated, the abdomen scaphoid. There were no masses or tender points. The liver was not enlarged. The thoracic viscera were normal.

Analysis of stomach contents showed a total acidity of 10, with absence of hydrochloric and lactic acids. Blood examination revealed: red blood cells 3,240,000; hæmoglobin 60; white blood cells 8,000. The Wassermann reaction was negative. Roentgen examination revealed a small vertical stomach, pyloric stenosis, retention, and diminished peristaltic contracture.

A posterior gastro-enterostomy was done. When the abdomen was opened, the stomach was found small and not adherent. The peritoneal surface was a dull grayish purple, the walls rigid and very thick. The pylorus would not admit the little finger. It was impossible to close the gastro-enterostomy clamp in the usual way and, therefore, the one on the stomach was not used. After the usual two posterior rows of linen sutures were in place, the stomach and jejunum were opened. The stomach wall was about 15 mm. thick and each layer stood out distinctly, the muscularis showing especially the glistening fibrous bands. The mucous membrane was thin and friable and the strings of white fibrous tissue running up from the submucosa showed plainly as they ran into the cyanotic mucous membrane and seemed to anchor it to the deeper layers. In contrast, the jejunum was thin walled and the mucous membrane protruded from the incision. A continuous catgut suture united the mucous layers and the two rows of linen sutures were carried around on the front of the anastomosis. The mesocolon was sutured in place and the wound closed in layers.

The patient made an uneventful recovery, taking solid food on the tenth day. She is now in perfect health, two and one-half years after the operation.

EDWARD L. CORNELL.

Remoen, C. M.: The Acute Typhoid Abdomen, with Especial Reference to Surgical Complications. *J. Am. M. Ass.*, 1916, LVII, 18.

Occasional operative reports and more frequent necropsy reports have fairly well demonstrated that the occurrence of acutely inflamed appendices in typhoid fever is more than a coincidence. It is not difficult to imagine the occurrence of the complication when one recognizes the pathology of the primary disease.

It is fair to say that many typhoid patients exhibit increased tenderness in the right lower abdomen. This may be expected when one recalls the usual situation of the lesions, the lower ileum. Hence, tenderness in the right iliac fossa may be only the result of localized patches of peritoneal inflammation due to underlying intestinal ulceration in this region. Fever usually exists, since the occurrence of this complication is to be expected more frequently when the typical lesions are most pronounced. When one inspects the peritoneal surface of the diseased ileum, in the third week, for instance, and sees the localized areas of peritonitis corresponding to the multiple ulcerations, the presence of fibrin and fibrinopurulent deposits and the purulent free fluid of variable quantity, it is easy to believe that an additional inflammation in an adjacent portion of the intestine may not change the symptomatology materially. It is enough that even the most closely watched patients may sometimes develop a perforation and die without the slightest inkling being given of a change in the abdominal features. In view of this, there are no clinical aids of any value at all which should be dismissed, and yet one often finds that on account of the depleted condition of the patient many of the usual clinical aids will fail in the test.

It is hardly a question in typhoid conditions as to whether a patient has appendicitis or perforation. It is merely a question of whether the patient is in such condition that, one or the other of these being suspected, the presence of either being a potential fatality, exploratory operation should be undertaken.

In a series of 9 cases of typhoid operated upon for suspected perforation, 4 showed acute appendicitis, in one of which there was a large perforation near the tip of the appendix. In passing, it is interesting to note that a fifth patient, who had the usual signs of subacute appendicitis of two days' standing, showed a perfectly normal appendix, but numerous large swollen glands in the lower mesentery — evidently the cause of the tenderness — proved later to be the first demonstrable sign of a subsequent typical attack of typhoid fever.

Of the 5 remaining cases, it is to be observed that in none was there an attempt to distinguish between appendicitis or suspected perforation. Rather the point common to all cases consisted in the signs of increasing peritoneal irritation in the right iliac fossa suggesting peritonitis, appendiceal involvement, peri-intestinal irritation from ulceration, or direct

perforation and the important question for decision was always, "Can we justifiably decide against exploration?", in other words, "Do we know that a fatal lesion does not exist?"

Three patients died within the first twelve hours. Each had general peritonitis with quantities of foul smelling purulent fluid and intestinal contents throughout the peritoneal cavity. Little may be expected in cases at this stage. This merely argues for early interference. Two other patients died, one eleven days later from the typhoid fever, after making an excellent operative recovery. Another died on the eighth day, after making a similar recovery, at which time the value of using silver wire as a suture in such cases was not recognized, and on the seventh day the wound parted, allowing the intestines to extrude under a full dressing. Four patients were discharged well after recovering from operation and the typhoid fever.

EDWARD L. CORNELL.

Wallace, C.: Early Treatment of Gunshot Wounds of the Alimentary Canal. *Lancet, Lond.*, 1915, CLXXIX, 1336.

In trying to arrive at the relative frequency of abdominal wounds the following data were obtained in a certain number of casualty clearing stations:

1. 1.88 per cent of all wounds.
2. 1.5 per cent of all wounds.
3. 0.75 per cent of all wounds.
4. 0.62 per cent of all wounds.

The statistics from 9 field ambulances and 7 casualty clearing stations for a period of six months showed the following results: Percentage of abdominal wounds to total wounds, field ambulances, 1.92 per cent, casualty clearing stations, 0.72 per cent. The difference is attributed to the greater mortality in field ambulances.

In 1,008 abdominal wounds in 9 field ambulances during a period of six months the mortality was 30.33 per cent. In 131 cases of perforating abdominal wounds in the same period from 6 casualty clearing stations the mortality was 58.40 per cent.

As to the influence of position of the wound and direction of the missile on the probable nature of the injury, it is noted that in the region above the pyloric plane are found the least serious among abdominal wounds. Side-to-side wounds, especially if they are located far back, are very serious. Vertical wounds, from above downward, are also serious.

Midline anteroposterior wounds are seldom seen, due to the vena cava and aorta occupying this line, wounding of which causes immediate death. The liver is most apt to be hit on the right side of this line, and the stomach occupies the space on the left side. Stomach wounds usually occupy both surfaces of the organ.

On the right side the liver will be hit; the taenia and greater curvature of the stomach will be perforated on the left side. The kidneys will be perforated by shots traversing the lateral lines of the

body including the spleen and splenic flexure on the left side. Uncomplicated liver and stomach wounds are as favorable as similar wounds in the epigastric region.

Oblique epigastric and hypochondriac wounds are necessarily more serious and they become more so as they become more oblique. The character of the liver wounds in these shots is marked by greater laceration and greater tendency to hæmorrhage, and the stomach wounds are marked by a long slit or double opening when the axis of the flight of the bullet becomes parallel to the anterior wall, in which case extravasation is prone to occur. The liver and stomach wounds are apt to be complicated by spleen, kidney, and splenic flexure involvement.

Vertical epigastric or hypochondriac wounds are nearly all inclined downward and inward, though they may be almost vertical, the entrance and exit wounds being located on the front of the body. In such cases the wounds of the liver and stomach are complicated by involvement of the colon or small intestine. Vertical wounds on the lateral surface appear as thoracic wounds when they show no exit wounds. Those on the right side are not so dangerous since they only traverse liver substance; those on the left are more dangerous as they are apt to implicate the spleen, stomach, or colon. These at first point entirely to thoracic injury.

Posterior and lateral wounds of the hypochondriac region are apt to be single entry wounds. Those from side to side are seldom seen, owing to their great fatality. They involve the liver, spleen, stomach, pancreas, and even the great vessels.

Wounds between the axillary lines often exhibit omentum protruded through the ribs. They are more serious on the left side from the spleen, kidney, and splenic flexure involvement. These wounds are often caused by shrapnel or shell fragments. Access to this region is not easy; the wounds are therefore difficult and unsatisfactory to treat.

Wounds between the transpyloric and intertubercular planes are very serious. Above the umbilicus they are like those above the transpyloric plane, and below the umbilicus the small intestine is involved.

Anteroposterior shots in the midline are seldom met with. On either side, in the upper part of this region the colon is involved and injuries to it are easily dealt with. Lower down, near the midline, the wounds are grave as they involve the small intestine. Toward the sides in the lumbar regions, we find wounds of the ascending or descending colon. If the peritoneal surface alone is involved the danger is not so great unless the wound in the wall is large. Wounds in the left lumbar region are very much more dangerous as the coils of jejunum overlie the great bowel. In flank wounds the colon and peritoneum may both escape owing to the thickness of the abdominal wall.

Wounds entering the back in this region are apt to plough up the retroperitoneal tissue by mechanical violence or by subsequent hæmatoma, and

they are consequently more fatal than anteroposterior wounds. Single entry wounds of the loin often injure the retroperitoneal tissue and pass into the colon. Shell fragments and wounds in this location are grave; they cause a large opening with escape of fæces but free drainage and the fact that the traumatism is in plain view assists in the steps to be taken. This is seldom the case in wounds caused by smaller projectiles where leaks in the retroperitoneal tissue may occur which may cause death before sufficient drainage is provided.

Side-to-side wounds are very fatal. If the small and large intestines are both involved, the spine or great vessels are injured since the vertical colons are set well back. For this reason side-to-side wounds which involve the small intestine alone seldom include the colon. The amount of damage done varies. In some cases the gut is lacerated and cut across, the transverse colon and central portion of the stomach may be all but completely cut by one bullet. There may be only clean cut perforations or the peritoneum only may be penetrated.

All wounds below the intertubercular plane are very serious. They include shots through the hips, thighs, and buttocks.

Anteroposterior wounds in the hypogastric region are very serious, especially when compared to anteroposterior shots in the epigastric region. Midline wounds are fairly frequent; the bladder is not often implicated unless it is full at the time of injury; the pelvic colon and rectum may be involved.

In the iliac regions the iliac colon and cæcum may be implicated.

Side-to-side wounds are very serious. Small intestinal wounds are nearly always multiple, the bladder and rectum wounds may be intra- and extra-peritoneal.

In vertical wounds the wound of entry is often through the buttock, peritoneum, or thigh, and the iliac vessels may be involved. The peritoneal wounds are often overlooked, but pain in the abdomen is often present and should lead to suspicion of internal injury. The fatality in these cases is due mostly to hæmorrhage from the iliac vessels and the fact that peritoneal wounds are often overlooked. Wounds of the rectum are quickly fatal from peritonitis.

The possibility of a bullet traversing the peritoneal cavity without injury to the viscera is discussed in an interesting way. The author gives a chart which shows a number of cases in which the abdomen was opened for exploratory laparotomy and in which no hollow viscera were opened although the entrance and exit wounds clearly pointed to such an injury. In these operations tears of the peritoneal coats of the hollow viscera, stomach, or intestine, were not infrequently seen, a fact which would indicate that even a modern bullet can push aside the visceral wall without perforating it. Such cases are believed to account in a certain proportion of cases for complications like fecal fistula and intra-peritoneal abscess.

Determination of peritoneal involvement to make sure that the wound is penetrating is frequently difficult. This is especially true when there is no wound of exit. Symptoms of shock, hemorrhage, rigidity, peritonitis, and rapid pulse point to penetration, but these are not always present.

Below the transpyloric plane an entrance wound on the right of the midline and the exit wound anterior to the right lateral line of the body is apt to be non-penetrating. On the other hand above the transpyloric line such a wound is almost sure to be penetrating. In the longitudinal direction an entrance wound near the costal margin with an exit wound above the grain points to penetration.

In the case of single entry wounds the symptoms alone indicate penetration or non-existence of peritoneal involvement.

A vertical wound entering from the thorax may give no sign for some time. A vertical wound entering from the buttock is apt to be attended with pain at the time of injury.

Absence of liver dullness is no criterion of visceral penetration. Abdominal injury from a bomb explosion which exhibits multiple small wounds may be attended with doubt as to the existence of penetration. Rather than explore one or two of these wounds for the purpose of diagnosis it is best to make an abdominal incision, and to be guided in accordance with the findings. The author has found as many as 14 perforations in the small gut from small fragments issuing from one bomb.

Symptoms of peritoneal involvement are generally: (1) rigidity of the belly wall; (2) rapid pulse; (3) indications of hemorrhage, and (4) absence of liver dullness.

Rigidity is seldom absent after 4 to 5 hours; the same is true of the rise in pulse-rate. Local trauma without penetration may show rigidity but the pulse-rate may not rise.

Symptoms of hemorrhage are hard to distinguish from shock. There is blanching and rapid pulse in both. In the case of hemorrhage restlessness is seldom seen. The same is true of air hunger and failure of sight. The amount of hemorrhage is generally very great before dullness can be of significance as a symptom.

Retroperitoneal hemorrhage causes decided abdominal rigidity and well-marked shock.

The effect that shock, hemorrhage, peritonitis, and septic infection of the retroperitoneal tissue have in causing death is shown as follows:

1. The amount of shock is usually severe and it may be absent or nearly so for a number of hours. What actually causes shock is undecided. Usually it is proportional to the extent of the injury; but profound shock may be present with a limited lesion or may be nearly absent in an extensive one.

2. Hemorrhage is probably the most frequent cause of death. Its source is from (1) great vessels, (2) the mesentery, (3) the omentum, (4) the abdominal wall and retroperitoneal tissue, and (5) the solid viscera. Of these, the mesenteric are the

vessels most frequently found bleeding when the abdomen is opened.

3. Peritonitis is the common cause of death, sometime after injury. It may be fatal within twenty-four hours if the infection comes from a wound of the rectum.

4. Infection of the retroperitoneal tissue may come from the bowel or the *bacillus aerogenes capsulatus*. In the case of the former the infection usually comes from wounds of the colon.

Trench fighting has permitted the establishment of well-appointed operating centers close to the fighting line, so that cases of abdominal wounds can be collected rapidly into an operating room under the management of expert abdominal surgeons. This fact has materially changed the management of abdominal wounds in military surgery. The conditions on the western front so far as this class of wounds is concerned approximate those in civil practice in well-appointed hospitals in which the surgeons control all the environments. The rule of operating early has become the vogue at the casualty stations on the western front. The rest-treatment supplanted by morphia, which obtained in the Spanish-American, Anglo-Boer, Russo-Japanese, and other recent wars in which the mobile armies were fighting in the open, is no longer favored.

In caring for patients before operation morphine is at once employed for the relief of pain and to allay anxiety during transport to the casualty station. Fluids should be administered in very moderate quantities. On reaching the operating hospital the patient is put to bed, and is given subcutaneous saline for the treatment of shock. If no improvement takes place hemorrhage is probably present and operation should be undertaken. If hemorrhage is found the chances of saving the patient's life are good.

At operation a paramedian incision is employed and it should be used in all cases unless it is contraindicated. A long incision saves time and shock. The first indication is to arrest hemorrhage and the second to systematically examine for wounds of the hollow viscera.

In resection circular enterorrhaphy is better than lateral anastomosis. Lesions of the small bowel must be dealt with first and the colon next.

The author gives no figures on the results of the cases operated upon but he promises to do so when a series of cases has been collected for six months. He states that the results secured so far indicate positively that the mortality at the casualty clearing stations has been very much reduced by early operative interference.

LOUIS A. LAGARDE.

Austin, A. E.: Simulation of (Esophageal Stenosis by Extensive Carcinoma of the Lesser Curvature of the Stomach. *Boston M. & S. J.*, 1906, (LXXIV), 44.

The author reports two personal cases and two cases gathered from the literature which simulated

oesophageal stenosis but proved to be carcinoma of the lesser curvature of the stomach.

The diagnosis is difficult. The vomitus may be free from hydrochloric acid and contain lactic acid in both conditions. Blood may be present in both. The stomach-tube may meet obstruction at the cardiac end of the stomach in both conditions, and in X-ray examinations bismuth has been found in the oesophagus thirty-five minutes after ingestion in cases of carcinoma. The deglutition sounds are unsatisfactory. Hoarseness and aphonia are suggestive of an oesophageal growth.

In summing up, the author says that "when we come across symptoms of dysphagia relieved by water-drinking, with inability to pass a soft tube, or difficulty in its passage at a point near the cardia, with eructations of food without hydrochloric acid and with rennin present, without a tumor in the abdomen but rigidity of the gastric borders, we are not to decide at once that we are dealing with oesophageal stenosis, but sometimes with general carcinoma of the stomach." D. H. BORD.

Troell, A.: Gastroptosis (Ein Beitrag zur Gastrotosefrage). *Arch. f. klin. Chir.*, 1915, cvii, 239.

In a work on gastroptosis written in 1913 Rovsing very enthusiastically advocated operation for this condition. Troell thinks that this enthusiasm is not justified by the results of operation, and in support of his opinion gives histories of 8 cases of gastroptosis in which he has operated or assisted in the operation. From his experience Troell concludes that there are no definite clinical symptoms due to changes in the position and mobility of the stomach alone, and that it is impossible to designate any definite degree of such change as being pathological. Most of the patients are women of slender, delicate build with unstable nervous systems, frequently with ptosis of other abdominal organs, retroflexion of the uterus, and a condition which may be described as universal asthenia. Gastropexy is not a procedure that can overcome such a condition.

The roentgenograms show that in some of the apparently successful cases of gastropexy there was really little change in the position of the stomach; in some cases there was improved position but even less motility. There is of course danger of attributing such cases to neurosis and not giving adequate treatment; but an overhasty surgical treatment without precise indications is equally unjustifiable. Roentgenoscopy should be utilized, not only in diagnosis, but later to determine the objective results of treatment. A. GOSS.

Meyers, S. J.: Preliminary Note on the Treatment of Visceroptosis. *Internat. J. Surg.*, 1916, xxix, 15.

In a short preliminary note Meyers reports his results in three cases of marked visceroptosis through the use of the "Rose binder." The binder is indicated for those cases showing no positive evidence of existing pathology, except a general abdominal

ptosis, accompanied by indefinite or obscure digestive and nervous symptoms.

The binder is of adhesive plaster, 36 inches in length by 8 inches wide. The lower border tapers from the center to about 2 inches wide in the back, a notch being cut in this edge to avoid contact with the iliac crests.

The bandage is applied in the exaggerated Trendelenburg posture with the widest portion immediately above the symphysis. It is then reinforced by applying a 2-inch strip upon each side extending to a higher point on the back. The bandage thus applied may be worn indefinitely without producing serious cutaneous irritation, although as a rule it is renewed at the end of a week. P. M. CHASE.

Tinker, M. B.: What Stomach Symptoms Justify Surgical Intervention. *N. F. St. J. Med.*, 1915, xv, 460.

Surgical intervention is justified in a large number of cases on the basis of a carefully taken history alone. When the history shows that there have been repeated attacks of indigestion with intervals of good health, severe epigastric pain, frequent vomiting, hunger pain and relief by taking food, unrelieved by a reasonable course of medical treatment, operation seems justifiable. If, in addition to this, the X-ray shows delay in emptying the stomach from partial obstruction, deposit of bismuth in chronic perforated ulcer, or great irregularity in stomach contour, the indication seems still stronger. If analysis of the gastric contents shows the presence of hyperacidity in ulcer cases or the absence of free hydrochloric acid with lactic acid in cancer cases, this is also strong confirmatory evidence. Blood, though not so frequently present, either vomited or obtained microscopically or shown as occult blood in the stools, is also valuable evidence.

While it may be impossible to arrive at a positive diagnosis in many of these cases, it is almost always possible to say that serious trouble is present inside the abdomen, and that the symptoms are of sufficient gravity to justify surgical intervention. Almost always it will be possible to determine with some degree of certainty whether the stomach and duodenum are at fault or whether the stomach symptoms are caused by lesions elsewhere in the abdomen. All modern means of diagnosis should be employed and the lesion located as definitely as possible so that in the majority of cases the operation is not really exploratory, but the lesion causing the symptoms may be attacked without undue handling of the intestines or manipulation inside the abdominal cavity. EDWARD L. CORNELL.

Freeman, L.: The Use of Free Omental Grafts in Abdominal Surgery. *Ann. Surg.*, Phila., 1916, lxi, 83.

One of the normal functions of the omentum is to seek out and attach itself to raw or inflamed peritoneal surfaces. When the inflammation has

subdivided, the adhesions tend to disappear; therefore it appears entirely rational purposely to make use of this function in abdominal surgery.

The author recommends free omental grafts in the following conditions:

1. In the replacement of lost portions of peritoneum where suitable flaps of peritoneum cannot be obtained. Free grafts are preferable to implants of fixed omentum because of the tendency of the latter to form constricting bands, and once fixed, the omentum could not migrate to the other portions of the abdomen where its help might be needed.

2. In the prevention of adhesions, omental grafts have been proved experimentally efficacious, and clinically the author has had satisfactory results in using them to cover raw surfaces after separating adhesions between adherent coils of intestine.

3. In the strengthening of suture lines in operations upon the stomach and intestines the free omental graft is well suited except when there is actual gaping of the wound or great tension. The graft should be large enough to reach well beyond the line of suture and be firmly secured by many sutures.

4. In pyloric and intestinal occlusion, twisting the grafts into cords and stitching the ends after encircling the parts to be occluded affords results superior to the use of foreign constricting material. In the checking of hemorrhage omental grafts are of unequalled value, not only for the cozing of raw surfaces but for spurring arteries as well, and especially for stopping hemorrhage from wounds in the liver.

The author draws attention to the following precautions: (1) In tying off the grafts sufficient ligature should be used so as not to pucker the pedicle into a bunch. (2) The graft should be excised as far from the base of the omentum as possible, and large vessels avoided. (3) No more tissue should be sacrificed than is positively necessary. (4) A number of stitches of fine cat-gut should be used to hold the graft in place. (5) The graft should entirely cover and project over the sound tissue on every side of the raw area.

Of the four objections, (1) multiple foci of hepatic necrosis; (2) gastric and duodenal hemorrhage; (3) the omentum might be required for other purposes; (4) the danger of adhesions to the raw omental stump, only the first two require serious consideration. Both are due to thrombosis, the first, venous, extending to the right epiploic vein and thence to the liver, the second, arterial, giving rise to emboli of the right epiploic artery. Both are exceedingly rare, and both may be avoided by avoiding large vessels and by ligating far from the base of the structure. E. FISHER.

Haynes, I. S.: The Significance of Pyloric Spasm. *Am. J. Surg.*, 1915, vol. 415.

Haynes makes a careful résumé of the anatomy, physiology, etiology, symptoms, diagnosis, and

treatment of pyloric spasm, defining it as a spasmodic contraction of the pyloric ring, pyloric canal, or both.

Haynes quotes the classification of Brown whereby eleven sources are enumerated from which pyloric spasm may result. There are many conditions that may produce pyloric spasm but there are only a few that commonly do so. Gall-bladder, chronic appendix, ulcer in the stomach or duodenum, are common causes mentioned.

The medical aspect is not discussed, but the author regards the recent work of Sippy, whereby delay is advised in gastric cases, as a step backward. Each year 26,000 people are dying in the United States from cancer of the stomach, 70 per cent of which develop on an ulcer base, so that thousands might be saved by appropriate surgical interference.

The author's conclusions are:

1. It is not humanly possible to determine the time when malignancy begins in an ulcer.

2. Operation should be performed early in all cases of ulcer. Nothing but early excision offers hope of cure of cancer wherever placed.

3. Sippy's procrastination teaching is retrogressive. All chronic cases should be treated surgically.

4. Gastro-enterostomy, cautery excision, pyloric excision, and pyloroplasty are methods which have been successful in his hands. H. G. GARWOOD.

McGuire, E. R.: Surgery of the Duodenum. *Long Island M. J.*, 1916, 1, 28.

The author asks how cases of duodenal dilatation without apparent obstruction can be explained, why there should be such a high toxicity to obstruction of the duodenum; why ulcer occurs so frequently in the first portion of the duodenum; why ulcer on one side of the pylorus is so prone, and on the other so resistant, to malignant change. Embryologically, the dividing line between the stomach and the duodenum should be placed at the junction of the foregut with the midgut and thus the first portion of the duodenum should be considered as a part of the stomach. Failure of accurate union of the fore- and midguts may explain partial obstruction of the lumen.

Recent work on duodenal obstruction shows that the duodenal mucosa may possess some peculiar toxic property, even without visible change in the outer coats, suggesting the need of removing the mucosa by resection in delayed cases where the intestinal wall seems viable.

Lesions in the upper abdomen impress one as being secondary to infective processes elsewhere, most frequently in the tonsils or teeth, and are frequently correlated with an abnormal appendix or with intestinal stasis. The question whether ulcers undergo malignant change is not settled and until it is, excision must be considered in the treatment of these lesions.

The conditions in the duodenum demanding surgery are congenital obstruction, ulceration with

later obstruction and perforation, the treatment usually being a question between excision and gastro-enterostomy. The latter operation is not ideal, but is frequently an operation of necessity. The excellent results following gastro-enterostomy occurred in those cases where healing of the ulcer caused sufficient contraction to close the pylorus. Experimental closure of the pylorus was attempted in a variety of ways on animals, in one group without enterostomy, as a result of which it was found impossible to produce obstruction by excising any amount of duodenal wall in a normal duodenum, and in a second group with gastro-enterostomy, using many different varieties of sutures, none of which were absolutely trustworthy. The most certain method was complete division of the duodenum with suture of both ends as practiced by von Eiselsberg. Clinically, however, it was found that by any method sufficient occlusion took place to send most of the bismuth through the anastomosis. In the human, because of the contraction of the ulcer in healing, any operation for pyloric occlusion is probably unnecessary. If a permanent block, for any reason is desired, probably the ideal method is that of von Eiselsberg; but in view of its greater danger it should not be attempted in any but exceptional instances, the ordinary infolding suture offering a sufficiently reliable method for most cases.

E. K. ARMSTRONG.

Parham, F. W.: Chronic Intestinal Obstruction Versus Intestinal Stasis. *Old Dominion J.*, 1916, xxii, 1.

Two cases of chronic intestinal obstruction are reported, in the first of which the characteristic symptom was colicky pain occurring spasmodically, accompanied by diarrhea alternating with attacks of constipation. X-ray barium pictures showed a distinct halting of the stream in the region of the sigmoid, corresponding with the point of pain reference, at which location a tumor was found. The pain was relieved by removal of this cause of incomplete obstruction. The second case was also characterized by the almost pathognomonic signs of partial intestinal obstruction, paroxysmal colicky pain relieved by a bowel movement. The X-ray observations were confusing. The opinion had been expressed that the trouble was due to intestinal stasis without organic constriction. The patient elected medical treatment under other hands and died six weeks later. Post-mortem examination showed that death was the result of jejunal intussusception of late development. The lumen of the descending colon was found narrowed just below the splenic flexure and this undoubtedly explained the pain and deterioration of health consequent upon the intestinal toxemia.

The lessons to be drawn from these cases are that the diagnosis of intestinal stasis discourages resort to exploratory investigation and the possible discovery of the true cause of the trouble. The X-ray examinations are invaluable as an aid in diagnosis,

but sole reliance must not be placed upon laboratory interpretations, which must be in accord with the symptoms or otherwise rejected. E. K. ARMSTRONG.

Ladd, W. E.: Intussusception. *Boston M. & S. J.*, 1915, clxxiii, 879.

During recent years the mortality rate at the Infants' Hospital and Massachusetts General Hospital has been rapidly lowered, for the reason that cases are diagnosed earlier than in former years.

A significant history of intussusception is the following: A baby apparently well is seized with severe pain, turns pale, and vomits. Following this the child has intervals of feeling almost well, and then a recurrence of pain occurs, with drawing up of the legs. In five to six hours a bloody stool is passed. A mass is usually felt at this period and the diagnosis should be comparatively easy. Later when tympanitis has set in with rapid pulse, fever, and leucocytosis, the chances for recovery are small. Operation should be performed in the early stages before these later symptoms have developed.

J. H. SKILES.

Ochaner, A. J.: Intestinal Stasis. *Surg., Gynec. & Obst.*, 1916, xxii, 44.

This subject has received much attention throughout the history of medicine from physician and layman alike.

During the past decade, Lane and his followers have made a surgical disease of intestinal stasis.

In the selection of cases for surgical treatment, the author advises the rejection of neurotic patients whose condition is not directly due to intestinal stasis.

The operative treatment should be limited to cases in which the stasis is due to a mechanical condition which can be relieved by a surgical operation.

The principal symptoms upon which a diagnosis can be made are described.

Sixteen X-ray plates taken from typical cases show that without a complete history and careful physical examination, the X-ray examination is likely to lead to serious errors. In order to be of value, the X-ray examination must be conducted by the clinician who follows his surgical cases into the operating room.

In case the operative treatment, which the author considers necessary in less than 10 per cent of all cases suffering from intestinal stasis, is indicated, the methods recommended by Lane should be followed with the addition of implanting the portion of the severed ileum which remains attached to the cæcum into the abdominal wall through a muscle-splitting opening in patients who suffer also from neurasthenia, in order to enable the surgeon to flush the entire colon at any time when there may be an accumulation of excrement in that viscus.

Short abstracts of some of the most important papers which have recently appeared on this subject conclude the paper.

Smithies, F.: *Chronic Intestinal Stasis and Its Associated So-called Toxemia*. Surg. Gen. & Obs., 1915, 110, 57.

Smithies maintains that clinically there is no definite class of cases whose physical make-up is grossly altered by chronic intestinal stasis. While many cases of the ailment conform to the "Lane type," a great group of patients with obstinate constipation are well nourished, full-blooded, and mentally alert. Smithies does not consider that the X-ray method of estimating the length of time for the passage of material through the large bowel is a dependable guide for the indication of stasis. He does not think that the so-called "motor meals" are physiological or comparable with meals of ordinary food which the patient has chosen himself. Not only do X-ray motor meals show great variations in the length of time which it takes them to pass through the colon of different subjects, but the variation is often quite marked when the same patient is observed at different times. Many individuals who have normal evacuations from the bowel can be shown to have stasis by an X-ray motor test-meal. An incompetent ileocecal valve appears to have no definite causative relationship to chronic intestinal stasis. Such findings are observed irregularly in individuals who are constipated, who have normal stools, or who are diarrhetic. X-ray plates made after colon injections may in the same individual or in different individuals show wide variations in the shape and position of the colon. These variations may have no bearing whatever as causative factors in the production of intestinal stasis.

Smithies does not think that experimental proof is at hand to demonstrate that harmful chemic or bacteriologic agents are absorbed into the system from the bowel in cases of intestinal stasis, and that the absorption of such materials is responsible for the widespread general disturbances described by Lane.

The author is inclined to believe that the alterations in the colon which are associated with chronic intestinal stasis are in large part secondary to chronic malnutrition in individuals who have local or general foci of chronic infection, such as head sinuses, germ centers about the teeth, tonsils, appendix, gall-bladder, uterus, tubes, etc.

Regarding the treatment of chronic intestinal stasis, Smithies urges that there be earnest co-operation between patient, surgeon, and internist. Before permanent good can be done by hygienic, dietetic, gymnastic, or medicinal procedures, he suggests that the surgeon should eradicate local infected foci wherever they may be located. If abdominal operations are decided upon they should be exploratory in the fullest sense of the term. Only where definite mechanical faults in the structure of the large bowel are demonstrated should "short-circuiting" or resections be performed. Some of the cases where "short circuits" or resections have been performed, have, in the author's experience, later shown most obstinate constipation or diarrhea and have often

been associated with anomalies in the digestive quality of the secretions of the stomach, liver, and pancreas.

Knight, A. L.: *Recent Research Work in Intestinal Stasis*. *Lancet-Clin.*, 1915, 110, 491.

The author of this article does not pretend to offer anything new, but in view of the importance of the experimental work done, he ventures to present a summary of the findings of Keith and Alvarez who have done some very important research work in this connection.

At the present time the problems of intestinal peristalsis, or lack of it, are receiving much attention, no doubt in great part because of the brilliant and radical work of the surgeons in the field of intestinal surgery. Keith's anatomical researches seem particularly valuable. It will be remembered that Keith and Flach, amplifying the work of His and Tawara, demonstrated the peculiar properties of the nodal tissue in the heart, both physiologically and anatomically. They demonstrated the anatomical verity of a peculiar tissue apparently intermediary between sympathetic nerve-tissue and unstriated muscle, having its node of greatest excitability definitely located at the sino-aortic bundle, and its final distribution to both ventricles. This tissue has within itself the power of originating and carrying on impulses, of maintaining tonicity, of responding to exciting agents, and of avoiding tonic spasm under ordinary, and; to a great degree, extraordinary stimuli. In that the heart and intestine have analogies in structure and function, and possibly in the manner of development, Keith thought that nodal tissue should be found in the intestine.

In the fully developed intestine, the myenteric plexus seems of a very complex texture. In addition to the ganglionic cells and much fine nerve-fiber network, Keith describes what he calls a third element in the plexus, which he says is very abundant—branching intermediate cells which appear to become continuous with processes of certain groups of muscle cells on the one hand, and with the branched processes of ganglionic cells contained in the nerve-fibers of the plexus on the other. This myenteric tissue can be demonstrated to be true nodal tissue, having the power of maintaining tonicity, of originating and conducting impulses, and of reacting in a specific manner to specific stimuli. There are points in the digestive tract where this tissue is particularly well developed, and from which peristaltic movement seems to originate, that is, points that are true nodal centers or pacemakers, notably at least anatomically, that center at the ileocecal junction.

Keith believes that there is a pace-maker for the stomach at the gastro-esophageal junction.

Throughout the entire intestine, and notably at its points of greatest tonicity—the pylorus, termination of the ileum, and descending colon, myenteric tissue can be demonstrated, often traveling in

sheaths, giving off through slits in the sheath denticles into the musculature that quickly are lost in muscle-cells, and all so far as is known, pointing one way — down the gut. Keith also calls attention to the enormous amount of glandular structure in the large intestine — considerably greater in bulk than the pancreas — and that it is of unknown, or, at least, uncertain function; also that the amount of muscular tissue in the large intestine is greater than that in the biceps, and Keith uses these as arguments against the "effluent sewer" idea of the colon.

Alvarez has demonstrated, apparently with certainty, that duodenal movement is more rapid, shallower, and more intermittent than jejunal, and jejunal than ileal; that waves do not move from one end of the small intestine to the other, but rather over tracts that seem to be fairly well defined by the old anatomical divisions.

The pathological morphology has been carefully considered in a few cases where the major portion of the great intestine has been excised for mucous colitis (or intestinal stasis) and the pathologic conditions in these cases seem quite clear. The process of inflammation in the intestine is probably not different from similar processes elsewhere, particularly in those structures where mucous membrane is first involved.

Keith made a section across the muscular coat of the ascending colon from a case of mucomembranous colitis which shows the hyperplasia and beginning fibrosis. All the tissues seem increased in amount, fibrous sheaths have formed about the musculature, and the process of fibrosis has invaded the myenteric tissue and is beginning to destroy cells and denticles. This chronically inflamed tissue would naturally be in a state of chronic excitability, consequently in a state of hypertonus, and Keith is convinced that in a great majority of cases which are classified under the somewhat elastic term of "intestinal stasis" the symptoms do not result from an atony of the musculature of the bowel, but from a hypertonicity of those parts which are normally in a state of tonic contraction.

Do kinks cause stasis? If so, it would be expected that stasis would be demonstrated in radiographs, at the hepatic flexure or in the ascending colon, which seems never to be the case, but stasis is demonstrated radiographically almost invariably proximal to rich distributions of myenteric tissue.

It may well be said that although at post-mortem there is no apparent anatomical lessening of the lumen of the bowel, the hypertonus, which we might compare to tonic spasm, creates a very real condition, calling for relief.

J. F. CASE.

Benmosche, M.: Second Report on a New Method for Facilitating Intestinal Anastomosis. *Internal J. Surg.*, 1916, XVIII, 410.

The author presents a mold of gelatine for making either an end-to-end or a lateral intestinal anastomosis. The mold for the end-to-end anastomosis

is a tube with a groove around the middle. The divided ends of the gut are brought together over the mold and united at the groove. The mold for the lateral anastomosis is the general shape of a collar button with a lumen through the shaft. The button part at either end is slipped into the opening made into the intestine, the ends for anastomosis being then brought together and sutured over the shaft.

The advantage of this "gelatine bolus" is that it dissolves in three or four hours leaving a united bowel free to heal without the interference of any mechanical foreign body. The method is a rapid one, hence, minimizing shock. The gelatine undergoing solution has hæmostatic value.

HENRY J. VAN DEN BERG.

McWhorter, G. L.: A New Method of Intestinal Anastomosis with a Study of the Intestinal Movements After Its Use. *J. Am. M. Ass.*, 1916, LXVI, 86.

The author's technique of the right-angle anastomosis is modified from the circular end-to-end method, in that the bowel is cut at an angle of 45 degrees, leaving the oblique mesenteric sides. The mesenteric portions are approximated first by a mattress suture, which, when tied on the inside, occludes the uncovered area of the bowel and invaginates the edges. With a needle on each end of this suture, the sutures are continued around so that this mesenteric half is first sutured accurately with a hæmostatic buttonhole stitch. These are then continued as Connell sutures, ending at that portion of the bowel opposite the mesentery. A Dupuytren stitch is then taken outside the first stitch to approximate a wide area of serosa. A few stitches join the mesenteries. If the ends are of unequal size, one may be cut more obliquely or an incision may extend up opposite the mesentery, as Curtis suggested in the end-to-end union. Where a lateral implantation is desired, the end may be cut obliquely as above. The right-angle union has advantages over the usual end-to-end in that it not only has a richer blood supply, but the angle of the blood-vessels toward the union lessens the danger of the second row of sutures causing gangrene of the inverted margin of the bowel. There is, therefore, less danger of leakage at the suture line, and also of contraction and stenosis. This can be done as simply as the circular union.

In the method of notch enterorrhaphy, the area to be resected is decided upon, soft jawed clamps covered with rubber may be applied to prevent the intestinal contents escaping, and the field is packed off with moistened gauze. The mesenteric vessels supplying the bowel to be resected are ligated. Double clamps are put on the ends of that portion to be resected. The bowel is cut between the clamps with a cautery, leaving them temporarily on the ends to be united. The ends of the bowel that are to be united are overlapped for union as far as desired, restoring the direction of peristalsis. The

overlapping of about 2 inches is usually satisfactory. A Dupuytren stitch taken along the sides near the mesenteries approximates them. The clamps temporarily holding the ends of the bowel closed may now be cut away, leaving healthy bowel ends. The sides of the intestines which approximate each other are nearly cut away, beginning at the end of the lumen, leaving a small edge of the side near the mesentery for the approximation of serosa by an inner stitch through all of the coats of the bowel. A similar width of the bowel is left on the convex side for approximation and invagination by sutures. These notched sections of bowel left should have rounded corners in order that they may be accurately approximated, though nearly a rectangle has been removed. A haemostatic buttonhole stitch is started on the side near the mesentery through all of the coats of the bowel, continuing around the other side as a Connell suture invaginating their edges. The Dupuytren stitch previously started is now continued around the first suture line, approximating a safe margin of serosa and completely re-establishing the bowel both as to shape and size. The edges of the two overlapping mesenteries are stitched down with a few interrupted stitches.

Animal protocols are appended and the results of X-ray findings noted. The following conclusions are reached:

1. There are distinct advantages of the notch and right-angle over the circular end-to-end and lateral anastomoses.
2. There is as early a resumption of physiologic function in the notch and right-angle anastomoses as in the circular end-to-end.
3. The pylorus, if controlled in dogs by a special protective mechanism, does not delay the food there from five to six hours after a high intestinal union, while the gastric peristalsis is active, as described by Cannon and Murphy in cats. There may be no demonstrable delay or there may be a short delay in certain cases.
4. Following any intestinal anastomosis, a localized loss of motor function remains, and possibly a general reflex sluggishness of the intestinal tract, varying to some extent with the degree of trauma, emphasizing the importance of delicate surgical technique.
5. There may not, necessarily, be a complete temporary loss of gastric motor function after necessary surgical handling for union to the bowel.

EDWARD L. CORNELL.

Lyle, H. H.: Left-Sided Appendicitis Complicating Transposition of the Viscera. *Ann. Surg.* Phila., 1916, lxxi, 124.

Lyle reports a case in which the history was that of a typical attack of appendicitis with abscess, the pain and mass however being on the left side. The heart was on the right side. The diagnosis was confirmed by operation and X-ray plates. Fourteen transposition cases have been noted at St. Luke's Hospital, N. Y. JIMORE, CONN.

Roux, J.: Appendicostomy (Quelques cas personnels d'appendicostomie). *Rev. med. de la Suisse Rom.*, 1915, xxxv, 814.

Roux has found appendicostomy of great value in cases of gastro-intestinal perforation followed by acute peritonitis. The nausea, vomiting, and cardiac and pulmonary symptoms are due to paralysis of the intestine. Drainage through the appendicostomy opening overcomes this paralysis and re-establishes normal peristalsis. At the time of the operation, the appendix is brought out and fastened in a buttonhole incision in the abdominal wall; its distal end is opened and drainage established through it by the drop method. This opening provides for the discharge of gases, but this is its least important function. The fluid introduced through the appendix is absorbed to such an extent that no other fluid need be given. Nothing need be given by the mouth until normal conditions are restored in the intestine. Generally after about twelve hours, the fluid discharged through the rectum is colored with bile, showing that the intestinal paresis is overcome.

Appendicostomy can be performed easily and quickly and does not prolong the major operation more than two or three minutes; it is followed by immediate and abundant absorption of water, which prevents shock, and rapid disintoxication is brought about by the lavage of the whole of the large intestine; siphonage of the small intestine is also accomplished. Appendicostomy is painless; it places the sutures at rest if they are above the colon, and the fistula is easily closed when its work is done.

Roux describes ten cases of his own, in one of which the bowel had been perforated in eight places by a bullet; two of the other patients had been run over by vehicles. Most of the other cases were perforated gastric ulcers. The appendicostomy gave results in these severe cases that he thinks could not have been obtained by any other method of treatment. A. Goss.

Strauss, A. A.: Complete Exclusion of the Large Bowel: Submucous Free Fascial Transplant Method, with Ileosigmoidostomy. *J. Am. M. Ass.*, 1916, lxxi, 267.

It has long been recognized that ileocolostomy alone nearly always results in a certain amount of regurgitation along the colon and cecum or the contents passes by the ileosigmoidostomy and follows its normal route. Colectomy has been advised by many for this reason, but once done the normal course of the intestinal contents along the colon could never be re-established. Several methods have been used to stenose the bowel, but none of them have been perfectly satisfactory, the securing sloughing or it being impossible to close the bowel over a fascial transplant. The author offers a method of excluding the colon by submucous transplant which is efficient and simple. A flap is resected from the anterior sheath of the rectus, three quarters by one inch. The ileum is picked up three inches from the ileocecal valve and the muscular

lar coats are divided down to the mucosa. The muscle is then stripped away from the underlying tissue very easily. A forceps is passed underneath the mucosa and the fascial transplant pulled through and sutured in such a manner as to hold the bowel in a collapsed condition. The muscularis is then closed over this and an ileosigmoidostomy performed in the usual manner.

Twelve dogs were thus operated upon, and at the end of four, six, and nine months necropsy showed the colon to be normal in every way. Ten more dogs were operated upon by the same method, except that the colon was closed in the same manner, completely excluding that structure. In six of these dogs the colon was emptied with apomorphine, while in four the bowel was not emptied, in order to see what effect the presence of intestinal contents would have on the general health. In all, except two that died from infection immediately after operation, necropsy showed the colon to be contracted down and the closure water-tight. In the four animals in which the intestinal contents were left *in situ* there was an inspissated mass above the colon closure, which, however, seemed to have no ill-effects on the animal.

The author concludes that while some of the contents found in the colon are the result of regurgitation, most of it is due to food passing by the ileosigmoidostomy into the cæcum and colon. Probably simple closure of the ileum below would suffice in most cases, and this would be safe in man.

E. K. ARMSTRONG.

Schoemaker, J.: Surgery of the Large Intestine (Kasnistisches und Technisches aus der Dickdarmchirurgie). *Arch. f. klin. Chir.*, 1915, cvii, 195.

Schoemaker describes three cases of ileus in old people more than seventy-five years of age. In the first case he made a diagnosis of obstruction from carcinoma but on opening the abdomen no mechanical obstruction of any kind could be found. He lost so much time in searching for the obstacle that the patient died. In the second case he made the same diagnosis, but remembering his first experience, when he could find no tumor he simply made an artificial anus and terminated the operation. Normal intestinal function was restored and the patient recovered. In the third case when no tumor or stenosis could be found he simply inserted a small drainage tube into the intestine and after normal function was restored removed it, when the fistula closed of itself. This dynamic ileus is given little attention in textbooks on intestinal surgery. In about 99 per cent of cases of ileus there is mechanical obstruction, but the surgeon in operating should bear in mind the possibility of this acute dynamic atony in order to avoid such a mistake as the author made in his first case.

He also describes two cases which had all the symptoms of appendicitis, except that they were on the left side. Laparotomy revealed the fact that in each case an appendix epiploica had developed a

cavity in the center lined with a continuation of the intestinal mucous membrane forming a diverticulum. In each case there was a very minute perforation of this diverticulum, resulting in peritonitis. Both patients recovered.

The author also describes his technique for resecting the large intestine without opening the lumen. When the point for making the resection is located he makes an incision down to the submucosa and pushes back the muscularis and serosa with the knife, leaving a tube of mucosa about 1 cm. long. He then puts two small clamps on the intestine and makes the incision, cutting so close to the clamps that no mucosa is left adherent to their outer surface. The resection is made in the same way at the other end and then the clamps remaining on the proximal and distal ends are brought together. The mucosa and serosa are now sutured over the clamps, and before the last suture is tied the assistant pulls out the clamps while the surgeon is tying the knot, so the intestine is sutured without having had the lumen opened. The method is illustrated. Schoemaker had to have a special forceps constructed as he found that the ordinary ones slipped off the intestine when the mucosa was cut off close up to them.

A. Goss.

Venable, C. S.: Stricture of the Rectum. *Texas St. J. Med.*, 1915, xi, 441.

Gonorrhœa of the rectum, ulcers, fistula, and the aftermath of operations or perirectal and other pelvic inflammations are much more frequently responsible for annular stricture of the second and third parts of the rectum than is syphilis. Forceful dilatation of such strictures is always dangerous and at best is but a palliative measure. Therefore, it is the author's custom to operate, his technique being as follows: After thorough division of the sphincters, a circular incision is made at the skin margin and the rectum freed; the gut wall is then dissected free in the perirectal plane until the base of the stricture is reached. Dissection is made around, not through this; once beyond the base, blunt dissection is continued until the rectal wall beyond the stricture or gut end of the fistula can be brought to the skin margin without tension. Sutures are then introduced and drainage provided for. With good technique and careful after-treatment permanent relief is afforded in most cases. LISTER TULLOCH.

McGavin, L.: A Case of Abdominoperineal Excision of the Rectum. *Clin. J.*, 1915, xlv, 385.

The author presents a case of carcinoma of the rectum and discusses the salient points in the treatment of this condition.

Bleeding is very often the first symptom and may occur without pain. In contradistinction to hemorrhoids the pain is not relieved by bleeding; also the bleeding in carcinoma is usually slight. The author strongly urges a rectal examination in all cases of bleeding from the rectum, rather than the taking for granted that the condition is hemorrhoidal.

The infiltration of the sphincters by the mass causes them to become weak and patulous, associated with this condition there is a "ballooning" of the rectum above the mass.

A patient in otherwise good health with a fair life expectancy, and having a growth, the limits of which are definable, is a suitable case for radical operation.

These are three operative procedures: perineal, Kraske's transanal excision, and the combined abdominoperineal excision suggested by the author.

A complete radical excision is practically impossible by the first two methods; the perineal method has been abandoned. The absolute necessity for an efficient colostomy opening eliminates the second method. Following is a brief résumé of the technique of the abdominoperineal method:

A transverse colostomy by Maydl's method is first done. The abdomen is opened and the pelvic colon delivered and cut between ligatures. Both cut ends are divided. Both internal iliac arteries are tied and the mesosigmoid stripped from its lymphatics. The rectum is next stripped from the pelvis and bladder, dropped into the pelvis and the incision closed.

A circular incision is then made around the anus, continued back to the tip of the coccyx and the anus closed by a purse-string suture. The rectum and colon with their lymphatics are removed through this incision. The colon is opened at the end of forty-eight hours.

The operation is a severe one, the chief dangers being shock, hemorrhage, and suppuration. The only places from which infection can occur are the cut ends of the colon and the site of the growth.

The author lays great emphasis on the site of the colostomy opening. He believes that the inguinal operation is much inferior to the transverse. There is less tendency to extravasation in the latter because there is not a perpendicular mass of feces above the opening; for the same reason there is less tendency to prolapse of the mucosa. There is better access to the opening for cleansing, and there are no nearby bony prominences. The opening is farther from the site of the primary growth and better sphincteric action may be obtained.

The author makes his colostomy opening in the left hypochondrium much in the position of a gastrotomy.

J. R. BOCHENSKI.

LIVER, PANCREAS, AND SPLEEN

Vaughan, G. T.: Three Cases of Recurrent Gall-Stones. *Am. J. Med.*, N. Y., 1916, 11, 111, 155.

The author reports the following cases:

Case 1. A young woman had been operated on ten months previously, stones having been removed from both the gall-bladder and the common duct. Prompt recovery followed with relief of symptoms for several months, then the biliary colic returned. At a second operation the author found twenty small stones in the gall-bladder, evidently formed

since the first operation. Cholecystectomy was performed with prompt recovery.

Case 2. A woman of middle age was operated on by the author. Three moderate-sized stones were removed from the gall-bladder and drainage of the gall-bladder established. Less than three months afterward she was again suffering with evident symptoms of gall-stones, and another surgeon removed the gall-bladder which contained a great many stones.

Case 3. A man about thirty-five years old was operated on by the author in December, 1915. Three stones were removed from the gall-bladder and drainage established. Recovery followed with relief of symptoms for five months then a return and persistence until the second operation in November when the gall-bladder containing one stone was removed. Recovery followed.

The author believes that re-formation of gall-stones is more common than is generally supposed.

C. H. DAVIS.

Mayo, W. J.: Restoration of the Bile Passage After Serious Injury to the Common or Hepatic Duct. *Surg., Gynec., & Obst.*, 1916, 22, 1.

Cholecystectomy has become the operation of choice for diseases of the gall-bladder. This operation has certain inherent dangers which must be very carefully avoided. In the Mayo clinic a number of cases are being met with in which, during the operation of cholecystectomy, the common or hepatic duct has been seriously injured, often severed, and sometimes a complete section removed, leaving a permanent obstruction.

This accident is brought about (1) because of anatomical peculiarities in which the cystic duct lies parallel with and adherent to the hepatic duct; (2) because the pelvis of the gall-bladder is not sufficiently dissected up so that the cystic duct is carefully exposed; (3) the cystic artery is not caught and, in attempts to catch it, the great duct is lacerated with heavy toothed forceps; (4) stones have caused ulceration which involved the common duct most often in the head of the pancreas which has later resulted in stricture; (5) or because of adenomatous formation of the stump of the cystic duct.

Operations for the restoration of the common bile duct are of a formidable character on account of difficult technique and the poor condition in which these patients usually come to operation. The Bevan incision is most appropriate.

The operations employed at the Mayo clinic have been: (1) resection of the obstructed portion of the duct with end-to-end union with the "T" tube which gives excellent results if the stricture be not over one-half to three-fifths inches in length; (2) in more extensive injuries of the duct, the hepatic duct should be united directly to the duodenum, using the Sullivan tube method as an adjunct; (3) direct union of the common duct to the duodenum, after the method of Coffey.

The results of these operations have been excel-

lent, quite contrary to a number of resections which have been done in this clinic for malignant disease in which both the immediate and ultimate results were poor.

Capelle: Implantation of the Common Bile Duct into the Upper Jejunum (*Choledochusimplantation in das obere Jejunum*). *Deutsche med. Wchnschr.*, 1915, xli, 1442.

Capelle describes the case of a man admitted to the hospital for gall-stone colic, vomiting, and icterus; in the last three months he had lost 40 pounds. The diagnosis of gall-stones with intermittent occlusion of the common duct was not confirmed on operation; there were no stones found either in the gall-bladder or ducts, but the gall-bladder showed inflammatory contraction, the cystic duct was obliterated, and the common duct moderately dilated. The head of the pancreas was enclosed in a hard, nodular infiltration. It was impossible to determine macroscopically whether it was chronic pancreatitis or tumor. This infiltration of the pancreas seemed to be the cause of the interference with the discharge of the bile. As the gall-bladder was impassable and contained only a little colorless mucus, it seemed useless to do a cholecystenterostomy. It was feared that if choledochotomy was performed with external drainage there would be a permanent fistula, due to further contraction of the head of the pancreas and further obliteration of the common duct, but the severity of the condition demanded an operation of some kind for relief. As the common duct was long and strong enough and readily movable it was decided to implant it into the upper jejunum. The duct was ligated and cut close to the pancreas. An abundant discharge of bile from above showed that the upper part of the common duct was open. A loop of jejunum just below the plica duodenojejunalis was drawn forward and the cross section of the common duct was implanted into it; it was sutured in several layers, the small intestine fixed into a slit in the mesocolon and cholecystectomy performed. All of the symptoms disappeared after the operation and the patient is now entirely well. This operation is indicated in cases of sclerosis of the head of the pancreas, either from inflammation or new-growth, in which cholecystenterostomy cannot be successfully done.

A. Goss.

Boas, L.: Treatment of Cholelithiasis (*Meine Erfahrungen ueber die Behandlung der Cholelithiasis*). *Therap. d. Gegenw.*, 1915, lvi, 446.

There has been such an enormous increase in the number of cases of cholelithiasis since the beginning of the war that it may almost be called a war disease. This is due to the increased nervous strain due to war conditions. Married women are especially liable to gall-stone disease and they are now especially subjected to worry on account of the loss of their husbands and sons, the breaking up of their homes, the difficulty in obtaining food, and the neglect of their own health.

The treatment is primarily surgical, especially when the stone is lodged in the common duct. No medicinal treatment will discharge the stone, and operation should be early as the patient is subjected to the danger of choleraemia if there is any delay. Chronic cholecystitis calls for operation also, especially in patients who have not the time and money for long-continued spa treatment. Acute febrile cholecystitis or cholangitis offers a more favorable field for medical treatment, while at the same time the prognosis for operative treatment is not so good.

In acute attacks of gall-stone colic it is a great mistake to give morphine as it interferes with Nature's effort to discharge the stone. The pain may be relieved by hot compresses, etc., or if a sedative must be given only small doses of papaverine or codeine should be used. Perhaps the reason there are so few successful attacks of gall-stone colic is that morphine is so freely given. Boas believes that local blood-letting is of great value. He sacrifices the skin over the gall-bladder and applies Bier's hyperaemia cups. This is especially useful in cases where there is extreme pain and enlargement of the liver.

There are no medicines that will directly prevent the recurrence of attacks of cholelithiasis. It is just as absurd to suppose that cholagogues will cause already existing stones to be discharged or prevent the formation of new ones as it is to suppose that gall-stones can be dissolved by chemical agents; but attention to diet and certain stomach conditions may aid in keeping the gall-stone trouble latent. Most gall-stone patients suffer from constipation, and an indication of prime importance is to keep the bowels regular. They also frequently have functional disorders of the stomach or ptosis of the stomach and intestines. Large amounts of food in the duodenum may obstruct the common bile-duct or facilitate the migration of bacteria into the bile passages. This assumption is confirmed by the fact that gall-stone attacks usually occur when the digestive tract is overloaded, and by the fact that they do not occur when there is stenosis of the pylorus and the food is discharged into the duodenum in very small quantities. Therefore meals should be light and taken at short intervals and heavy meals should especially be avoided at night. Spa treatment is of great value, not because of any specific effect of the waters, but rather on account of the associated rest, dieting, regular meals, baths, and outdoor exercise. The stay, however, should be much longer than is usually prescribed to be of any benefit.

In severe cases of acute cholecystitis Boas recommends the giving of calomel 0.1 gm. three times a day for at least four weeks. Russian physicians, who introduced this treatment, give as much as 0.5 gm. several times a day. The prognosis is much better where only the gall-bladder is affected than where the ducts are involved.

Recurrences after operation may be due to the

reformation of stones or to adhesions, but these recurrences are not nearly so severe as the original condition and generally yield to prolonged spa treatment.

A. Goss.

Knox, J. H. M., Jr., Wahl, H. R., and Schmelsor, H. C.: Gaucher's Disease. *Bull. Johns Hopkins Hosp.*, 1916, XLV, 1.

The authors present the cases of two infants, sisters, who did not thrive from birth and died, one at 11 months, the other at 15 months of age, from gradually increasing weakness. The most striking clinical feature was the great enlargement of the spleen and liver. The blood picture was that of a moderate anemia. The leucocytes were rarely increased, and for the most part were markedly reduced in number. The skin in both cases had a peculiar yellowish-brown hue, more marked on the face and exposed surfaces. In one case the diagnosis was confirmed during life by the examination of an excised lymph-gland. Microscopically, in both cases nearly all the organs were found to contain large, pale, granular, or finely vacuolated cells, in which there was a peculiar refractive substance having the chemical and staining properties of lipid material. These cells are apparently identical with those described by Gaucher and others in the condition called "Gaucher's disease."

The characteristic lesion in these two cases was the widely diffused accumulation and proliferation of the large, pale, granular, or finely vacuolated cells, most prominent in the lymphadenoid tissues, but apparently involving more or less extensively the reticular cells and the lymph-vascular endothelial cells, the process being generally associated with localized accumulations such as have been described in the medulla of both adrenal glands. The process was equally marked in the lymph-nodes

as in the spleen and probably had begun simultaneously in both locations, other susceptible tissues being subsequently implicated. The large pale cell was also found in bronchi, arteries, veins, capillaries, glomerular tufts, scattered between renal tubules, in the mucous membrane of the stomach, in the capsules of various organs, in the pia, brain, and in large numbers in the bone-marrow. The occurrence of vacuoles in the parenchymal cells of most of the viscera—including the heart, pancreas, kidneys—thyroid, submaxillary salivary glands, in the Purkinje cells of the brain, in the nerve-cells of the anterior horn of the spinal cord, in the bipolar cells of the posterior root ganglion of the spinal cord, taken in conjunction with the negative results after the use of fat stains, indicates either a vacuolar degeneration or an accumulation of lipid material in those cells as in the large pale cells, and suggests the presence of a very general pathological process, involving especially the lymphatic system.

GEORGE E. BELLBY.

Pool, E. H.: Splenectomy for Von Jaksch's Anemia. *Ann. Surg.*, Phila., 1916, LIII, 122.

Pool reports a case of von Jaksch's anemia in a child of eighteen months on whom he had performed a splenectomy, with good results. The examination prior to operation may be summarized as follows: marked anemia, rickets, and an enlarged spleen. The blood examination was as follows: negative Wassermann; red count 1,700,000; hemoglobin 45 per cent; white cells 12,000; polymorphs 47 per cent; normoblasts and megaloblasts were present. A spleen weighing 230 grams, showing a high grade meloidization, was removed May 11, 1915. Three weeks after the operation the red blood count had risen to 4,500,000 and the hemoglobin to 60.

ISIDORE COHEN.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS. CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Worms, G., and Hamant, A.: Study of Coxa Valga (*Étude sur la coxa valga*). *Rev. de chir.*, 1915, Nov.

The following classification of this condition is given:

1. Congenital coxa valga, either isolated or combined with dislocation or subluxation of the femur.
2. Traumatic coxa valga.
3. Rachitic coxa valga.
4. Static and functional coxa valga.
5. The coxa valga of adolescence or idiopathic coxa valga.

Among the etiological factors which are at work in congenital forms, abnormal conditions of the uterus are mentioned. A number of years ago Friedlander of Vienna referred to maternal causes,

as, oligoamnios, hypertrophy of the liver, pressure of the uterine wall, as conditions responsible for the occurrence of coxa valga as well as for the congenital dislocations of the hip. The association of these two conditions has been pointed out by a great number of observers, and although their views differ materially as to the frequency of this relation, it may be said without exaggeration, that at least two per cent of all cases of congenital dislocation of the hip show a coxa valga deformity. The subluxation is an intermediate stage between the normal and the dislocated hip. Ogston and Kiapp were the first to call attention to the concurrence of these two conditions. They are not interdependent on each other, but rather represent two distinct pathological conditions.

In rickets coxa valga has been observed not infrequently. It is very often a compensatory deformity associated with curvature of the shaft of

the femur. In rare instances coxa valga has been observed in osteomalacia, and in tuberculosis of the hip.

There are unquestionably instances of a merely traumatic form of coxa valga, although it requires a special mechanism of the trauma to produce this deformity, as Drehmann has pointed out. In regard to treatment the plaster of Paris fixation has given most satisfactory results. A number of cases require subtrochanteric osteotomy. The author reports a series of cases from his own experience and from the literature.

A. STEINBLER.

Faber, H. K.: Experimental Arthritis in the Rabbit; a Contribution to the Pathogeny of Arthritis in Rheumatic Fever. *J. Exp. Med.*, 1915, xxii, 615.

The author reviews the literature and cites a carefully worked out and reported series of experiments on rabbits in the production of arthritis by the injection of various bacterial strains, three of streptococcus viridans and two of pneumococcus and one of bacillus typhosus. None of them were virulent strains and none caused arthritis on less than three injections. A successful attempt was made to sensitize joints both by successive intravenous injections and by preparatory intra-articular injection of dead and living bacteria. The article is an intensely interesting and suggestive one.

The author summarizes as follows:

1. By a process of sensitization it was found possible to cause arthritis in rabbits constantly after one intravenous injection of an organism which otherwise required three or more injections. This reaction is specific.

2. An analogy is suggested between arthritis by sensitization, and the relapses in human rheumatic fever. A further analogy is suggested between the development in rabbits of arthritis after repeated intravenous injections and the development of the primary lesion in rheumatic fever.

3. No one organism is responsible but evidence tends to show that various streptococci, especially of the viridans group, are most efficient.

F. C. KIDNER.

Nutt, J. J.: The Treatment of Tuberculous Arthritis. *Am. J. Orth. Surg.*, 1916, xiv, 1.

If the patient is a child and comes under treatment early, and only one joint is involved, and perfect control of the case is had, recovery with good functional movement and with little or no deformity may be expected, except in infection of the upper spine where it seems impossible to avoid deformity.

Where deformity is already marked and destruction of bone is already present, the prognosis is an ankylosed joint with some deformity.

The most essential thing in the treatment of a tuberculous joint in a child is to attend to the general condition of the patient. Respiration, circulation, digestion, excretion, exercise, and mentality are each to receive consideration.

It is necessary for the patient to be outdoors twenty-four hours a day. A sparsely settled neighborhood is desirable and the country is preferable to the sea shore. The diet should be a mixed one, unless there are specific reasons to the contrary. The appetite should be stimulated by personal attention. The bowels should move well, daily. The total quantity of urine should be kept up to normal. The skin must be kept active. The patient must be kept in a cheerful state. Exercise is good if local conditions will permit it.

When bed treatment is necessary he prefers to keep the child in bed with a well adjusted brace rather than a frame.

Under no circumstances should great force be used to correct a deformity. He finds Bier's treatment to be of very little value.

After eighteen months of thorough trial he finds tuberculin to be of no other use than that of a good general tonic. Heliotherapy has no specific action. He has discarded Beck's paste. He is inclined to believe that bone-grafting is indicated, especially for adults.

PHILIP LEWIN.

Varay, F.: Gunshot Injuries of the Joints at the Front (Plaies des articulations par projectiles de guerre dans une ambulance immobilisée de l'avant). *Lyon chir.*, 1915, xii, 654.

The diagnosis of medium and large sized injuries of the joints is only a question of inspection; but it is difficult in bullet wounds with punctiform openings and in wounds with no exit when the projectile has not been located. These doubtful cases should never be explored at the sorting ambulance but should be sent directly to the surgical ambulances where the diagnosis may be made by X-rays.

The seriousness of a joint injury depends on whether or not the joint is infected; so the aim of treatment is to prevent infection. In small punctiform wounds the joint should be immobilized and watched carefully; arthrotomy should not be performed at once even if puncture gives an effusion which shows a positive culture. If there is no local reaction and the temperature is not above 38° the infection can be overcome. On the slightest clinical signs the joint should be drained, but all larger wounds ought to be drained without delay.

Two cases are described that came in together illustrating the importance of immediate arthrotomy. Both had injuries of the knee-joint, the first apparently much more serious than the second. In the first case arthrotomy was done; the fever disappeared by the third day; recovery was uneventful and the patient was discharged in excellent condition the twenty-ninth day. In the second case the knee injury was slight and showed no inflammatory reaction, so it was decided to wait. At the end of twenty-eight hours the joint had become painful and the temperature had risen to 39.5°. Arthrotomy was then performed but the infection had become so serious that the temperature was not normal until the twenty-second day and the man was

still in a serious condition when he passed out of the author's service.

To be most effective arthrotomy should be prompt. Its object is to prevent, not to cure infection. It should also be extensive; it fails sometimes from being too timidly performed.

If free arthrotomy is performed a good view can be obtained of the joint lesions, and if they are serious enough to demand it resection should be performed at once. The resection should be atypical; in every case only so much as is necessary of the bone should be removed. In very severe injuries, veritable explosions of the joint, total resection may be indicated. Rarely, however, is it necessary for resection to be performed at once, and still more rarely is immediate amputation necessary. But it is of great importance that the surgeon should be able to recognize the cases in which it is necessary, for primary amputation gives a much lower mortality than secondary amputation. Expectant treatment, arthrotomy, simple or complicated resection and amputation are the various degrees of operative intervention; but the important thing is to know which to adopt in order to precede and not follow the course of the infection. A. Goss.

Roux: Treatment of Gunshot Injuries of Joints

(*Ueber die Behandlung der Gelenksverwundungen*). *Deutsche med. Wochenschr.*, 1915, No. 1474.

Roux points out that the frequency of grenade and shrapnel injuries in this war make a more active treatment desirable than in former wars, though very small wounds may recover under the old conservative methods. In the treatment of injuries of the joints he has come to the conclusion that resection gives better conditions for drainage than simple arthrotomy and shortens the period of hospital treatment. Almost all bullet wounds and some small grenade wounds are not primarily infected; but even cases with abundant purulent exudates may recover with very good function. Complete immobilization produces quite remarkable results in many cases, particularly in the knee-joint and in the so-called intermediary stage. But when a joint wound shows severe infection for a few days, or where there is a great deal of crushing at first, there should be arthrotomy, supplemented by removal of the cartilaginous surfaces. Often great harm is done in joint injuries by using too conservative treatment; the surgeon does not perform arthrotomy because puncture seems to be giving good results; then he hesitates to perform resection because it is a severe operation and is followed by ankylosis, and so the patient has to undergo all these procedures successively, but each one is a little too late, and he finally succumbs to the infection. A. Goss.

Beckman, F.: Giant-Cell Tumors of the Tendon Sheaths. *Ann. Surg., Phila.*, 1915, 110, 738.

Three cases are reported, in the first, a girl 12 years old had noticed a growth for four months at the base of the index-finger on the flexor surface.

There was no pain, no increase in size, and no history of injury. A vertical incision 1 inch long was made and the small round tumor popped out from inside the tendon sheath, being attached only by a threadlike pedicle. On section it was found to be cartilaginous, the surface being of uniform smoothness.

The second case was that of a man 46 years old, who had a swelling on his foot for three years, but experienced no discomfort except from rubbing of the shoes. Three months before seeking advice a second lump appeared close to the first. They were at the base of the first and second metatarsals on the dorsum of the foot. They were easily excised and proved to be a bilobular tumor, one tendon passing over, the other under it. He died two years later of recurrent tuberculosis.

The third case, a woman of 36, had a small swelling on the dorsal surface of the distal phalanx of the index-finger, which had grown slowly for eighteen months until it was the size of a pea. It was easily enucleated through a small incision. In each case microscopical examination showed cells resembling those in endothelioma with places of fusion leading to the formation of indefinite giant cells. In no instance was there recurrence. Giant-cell tumors are not rare, but little has been written about them in the English literature. The French and Germans have written considerable, classifying them as giant-cell sarcomata and myeloid endotheliomata. Little is said of these growths in textbooks, but over half of the tendon sheath sarcomata are of the giant-cell variety. They occur more frequently in men, and in the second, third, and fourth decades, though they do appear later. The greatest number are seen between the ages of 30 and 40 on the hands and feet, more often the former, 66 per cent on the right hand, 80 per cent on the flexor surfaces. Those found on the foot are usually in the peroneal tendons near the external malleolus. Trauma is said to be a cause, but this is disputed; none of the three reported cases gave such a history. Examination shows a hard, smooth, round or lobulated, painless swelling not fastened to the skin, and though sometimes attached to the tendons, rarely interferes with their movement. The size and shape of course vary with the position, but they are never very large. The color is dark reddish-brown to light yellow. The histological picture resembles a giant-cell epulis more than any other giant-cell tumor, but it does not develop from peritendrium. Also like the epulis it does not metastasize or recur on removal. Some writers classify these growths as sarcomata, others as myelomata, still others as grandiomata. Mallory says the giant cells in this type of growth are only foreign body cells and the tumor should be named from the character of the cells in the stroma. Beckman says none of these men have proved the inflammatory origin of these growths, nor does he think the giant cells resemble in any way those due to chronic irritation. He also says that though the microscopic appearance is that

of cellular connective tissue neoplasms, their behavior is that of a simple benign growth. The author concludes that the best name is "giant-cell sarcoma of the tendon sheaths."

C. A. STONE.

Schloessmann: Open Dry Treatment of Gas Infection, Especially Gas Gangrene (Ueber die offene, austrocknende Wundbehandlung bei Gasinfektion, insbesondere bei Gasgangraen). *Muenchen. med. Wchnschr.*, 1915, lvi, 1953.

Free incision is generally sufficient in superficial gas phlegmon, but in advanced cases of gas gangrene it is not. Amputation is often necessary, but sometimes even this is impossible when the gangrene is on the trunk or just at the root of the limb, so that it cannot be completely removed. The infecting bacteria are in the deep tissues and the dead muscles lie above them in a thick layer of soft tissue, effectually shutting out air and producing the best conditions for their development. The soggy muscle tissue closes in on drains and tampons so that they become ineffective almost immediately. In such cases Schloessmann advises opening up the wound thoroughly, his method being as follows:

The skin is incised and dissected back over the whole gangrenous area, the points of the flaps being sutured to the sound skin. The edema indicates the place to which the dissection must be carried. Then the dead muscle tissue is opened up with the finger, it being not necessary or desirable to use a knife. It is very easy to distinguish between the dead and normal muscle, and no matter how large a mass of muscle is necrotic it should be removed up to the edge of the sound tissue. It is astonishing how large a mass of muscle can be removed without producing any serious functional disturbance. The wound is then left open to the air, a wire screen being placed over it to prevent the bed clothes from touching it. The free access of air destroys the anaerobic bacteria and the moist gangrene is quickly converted into a dry necrosis. The temperature falls quickly and the pulse improves in quality. Even if large vessels are laid bare no harm is done.

A case is described in which the gangrene was in the region of Scarpa's triangle and the femoral vessels were exposed. The circulation was undisturbed, and as the wounds healed they became covered over with muscle again. While Schloessmann does not think that dressings should be abandoned in all wound treatment he feels that open treatment is unconditionally indicated in these severe cases of gas gangrene.

A. Goss.

Dupeyrac: Treatment of Diabetic Gangrene with Hot Air (Traitement de la gangrène diabétique par l'air chaud). *Rev. de chir.*, 1915, xxxiv, 408.

Dupeyrac presented to the Surgical Society of Marseilles the foot of a patient who had had diabetic gangrene; it had been mummified by hot air at about 700°. The gangrene had been pursued with this treatment to the middle of the calf. The septic

phenomenon had yielded rapidly, the temperature fell from 39.5 to 37°, but after a line of demarcation had been formed the patient died of pulmonary edema and myocarditis. He pointed out that with this treatment it is possible to dry up the gangrene and render it aseptic, and after the dangers of septic infection are removed the amputation may be done.

ROUX DE BRIGNOLES reported two cases of diabetic gangrene treated with hot air. The first patient is still under treatment. The second was a woman who was sent to him for leg amputation. Her general condition was bad; her temperature was 40° and the sugar varied from 7 to 45 gm. to the liter of urine. The foot was cedematous and all the leg was infiltrated. Under the hot-air treatment the condition subsided and it was only necessary to amputate two toes.

IMBERT thinks that the introduction of the hot-air treatment has introduced a new era into the treatment of gangrene. Its action extends to a great enough depth to bring about a real and useful sterilization of the tissues. He thinks that operation should not be early, but that one should wait till there is a very clear line of demarcation to avoid sacrificing too much. With the hot-air treatment it is possible to wait, but there are two indications for operation: marked sign of infection and intense pain. With reference to the last indication he reported the case of a woman who had intense pain and he was about to amputate the whole foot. As a result of reading an article by Morestin he did a nerve-section, which not only stopped the pain but arrested the progress of the gangrene.

A. Goss.

FRACTURES AND DISLOCATIONS

Grossman, J.: Fractures of the Elbow. *Med. Rec.*, 1916, lxxxix, 93.

This paper is based on the study of fifty cases of fracture of the elbow, which were treated by the acute flexion position. The author advises that every case of injury to the elbow when the diagnosis is doubtful, should be placed in the acute flexion position until the diagnosis is cleared up by the X-ray (except fractures of the olecranon process). Passive movements and massage are begun about the tenth day and continued until the movements of the joint are normal and free from pain. Many of the cases are reported in detail. The article is illustrated with photographs and radiographs.

A. J. DAVIDSON.

Greenough, R. B., Osgood, R. B., and Vincent, B.: Gunshot Fractures of the Extremities. *Boston M. & S. J.*, 1916, cxxxv, 57.

The author's report is based upon a series of 148 fractures in 139 patients seen in the Harvard University Service at the American Ambulance at Neuilly-sur-Seine, France, from April 1, 1915, to July 1, 1915. There were 139 compound fractures

8 of which were incomplete, and 15 closed or simple fractures. Irregular comminuted fractures were the rule. Only 3 of 111 compound fractures healed by first intention. This was attributed to contamination of the wound by clothing, dirt, etc., at the time of injury.

The average case reached the American Ambulance on the third or fourth day, having had saline and a first-aid dressing applied at the front. Practically every case received tetanus antitoxin, and was immobilized in tin or aluminum splints for the journey to the base.

The routine treatment consisted of anesthesia, enlargement of the wounds of entrance and exit, removal of foreign material, and detached bone fragments, irrigation with sodium hypochlorite (1:1000), drainage with rubber tissue, and fixation in extension. Metal splints were occasionally used, but plaster dressing reinforced with bridges of steel or wire gauze with a window cut for dressing was the common method of fixation.

Excluding injuries of the fingers there were six amputations performed in the Harvard University Service, as follows: for secondary hemorrhage, 2 cases; for sepsis of the knee or ankle-joints, 3 cases; for gangrene and gas bacillus infection, 1 case—this case died, the one fatal case.

The most important complications were sepsis, secondary hemorrhage, nervous and delayed union, and complicating nerve lesions.

A certain number of cases required orthopedic treatment and apparatus for the prevention or correction of ankylosis and contractures.

Of the 16 closed fractures, 3 were operated upon and fixed by the open method with plates or bands.

The conclusions drawn from these cases are as follows:

Early and thorough operative treatment is indicated in gunshot fractures received under the conditions of trench warfare.

The removal of missiles, foreign bodies, and detached bone fragments, and thorough drainage are important.

Complete immobilization in extension is as a rule best obtained in a base hospital by plaster dressings put on under anesthesia.

Frequent and painstaking dressings, with or without irrigation, and the maintenance of free drainage are of great importance in overcoming sepsis.

Prophylaxis is better than corrective treatment in the avoidance of ankylosis of joints and contractures of muscles and tendons.

Solomon, E. P.: Potential Factors in Fracture Surgery of the Shafts of Long Bones. *Internat. J. Surg.*, 1928, 1:100, 205.

The author reviews the writings of many surgeons as to their care of fractures of long bones, and presents what in his opinion is the best line of treatment in these cases.

He believes that the treatment of fractures of the

long bones should not always be operative, nor always non-operative, his aim constantly being to get the best functional results. His rule in the treatment of any fracture is to skiagraph before and after reduction, the reduction being accomplished under an anesthetic. If the deformity cannot be reduced from an anatomical standpoint, he believes it is a case for open operation.

He outlines his treatment for various fractures of long bones, sometimes using open operations, again splint and traction, and plaster of Paris dressing, and seems to have no fast or fixed rule. He favors the use of the Lane plate in many of his cases.

C. C. CHATTERJEE.

Baudet, R.: Fracture of the Astragalus (*Contribution à l'étude des fractures de l'astragale*). *Rev. de chir.*, 1915, xxiv, 305.

Baudet reviews the literature of the subject. Up until the introduction of radiography fracture of the astragalus was seldom correctly diagnosed and treatment improperly applied led to very bad functional results. In an injury of the foot from falling on the foot with a pronounced varus position and when the pain can be localized over the neck of the astragalus a fracture of this bone should be suspected, and should be confirmed by radiography. The prognosis as to function is much better in recent years than formerly. The treatment may be simple reduction, operative reduction, operative reposition, or astragalectomy. Simple reduction with immobilization in a plaster cast should be accomplished by the aid of radiography and should be followed by massage and mobilization. The treatment must be long-continued to get good functional results. This treatment is indicated in simple fractures of the neck with only slight displacement.

The functional results of simple reduction are not very good in fracture of the body. If simple reduction fails or if the fracture is compound, operative reduction is indicated. In the great majority of cases, however, total astragalectomy is indicated, particularly in cases of fracture of the body with luxation of the posterior fragment, fracture of the body with displacement that cannot be reduced simply or by operation, and in all cases of infected fracture. Partial anterior astragalectomy and partial posterior astragalectomy have given good results in a few cases but they do not correct the wrong position of the fragment that is left in place. In anterior astragalectomy sufficient support is not offered to the tibia when the foot is extended on the leg. In posterior astragalectomy the head and neck form a wedge when the foot is flexed on the leg, so that total astragalectomy is to be preferred to these partial operations. Baudet is not so radical, however, in advising astragalectomy as the older authors, because the experience of recent years has shown that many cases can be successfully treated by the more conservative methods of simple or operative reduction.

A. Goss

Delbet, P.: *Method of Treating Fractures* (*Méthode de traitement des fractures*). *Rev. de chir.*, 1915, xxiv, 249.

The essential feature of Delbet's method of treating fractures is a metal extension apparatus which is applied at once, after which the patient is allowed to get up and walk. By means of a hollow metal rod into which a solid one glides, like a curtain rod, provided with a spiral spring, extension is accomplished. There are holes half a centimeter from each other, and by driving pegs into them the apparatus can be made rigid at any desired length. The points of support are metal or plaster rings passed around the upper and lower extremities of the fractured bone, leaving the joints free. The details of the application of the apparatus to the different bones are described.

Delbet holds that the object of fracture treatment is not only reduction and mobilization but early restoration of function. This is not accomplished by any of the older methods of fracture treatment. It is impossible to reduce a bone by manual traction. Traction must be steady and regular to overcome the resistance of the contracted muscles. Manual traction is jerky and irregular, and between the jerks the contracture of the muscles is increased. The steady continuous traction exerted by his apparatus obviates this difficulty and corrects the shortening. It does not bring about a perfect coaptation of the fragments, but this is not necessary to perfect function, as has been shown beyond doubt by radiographs of perfectly functioning limbs. Plaster troughs prevented secondary displacement of the bones, but only if they were extended beyond both the adjacent joints. This caused stiffness of the joints and tendon sheaths and atrophy of both muscles and bone from disuse. The bones did not decrease in size but they became decalcified. This was shown in the roentgen pictures, in which the shadow of the fractured bone was much more transparent than that of the uninjured limb. The callus was often quite transparent, so that patients sometimes refused to walk on the leg because they did not believe the bone was consolidated when they saw the clear space between its ends. The transparency of the callus was due to the poor nutrition of the limb. For all these reasons it took the patient a long time and much after-treatment to recover, not from the fracture, but from the treatment he had been given for it.

Fixation by means of plates, such as those of Lane and Lambotte, had much vogue for awhile, for there was no doubt that it secured perfect anatomical results, but this does not necessarily mean perfect functional ones. Moreover, it is necessary to immobilize after-fixation with plates, and sometimes for a longer period than in fractures not treated by operation. So this method involves all the disadvantages of plaster immobilization. The method of nail extension overcomes this objection, but the bones do not always bear the nails well, and there is danger of infection. This method

should be reserved for cases where no other is effective.

Championnié advocated massage and mobilization in the treatment of fracture, but he went too far and deformities resulted that were hardly justifiable. Delbet advocates the immediate use of the limb, but insists on the importance of an apparatus which holds it in place without interfering with function. It has been shown by animal experiments that use of the limb hastens, rather than retards, consolidation. He points out that when patients with his apparatus walk they are really using their muscles and joints, not merely passively supporting themselves with the apparatus. It is important that the apparatus be applied at once, for the work of repair begins very quickly and any delay causes the loss of this early repair, while a late reduction constitutes a fresh traumatism.

A. Goss.

Moore, J. E.: *Operative Treatment of Bad Results After Fracture.* *J. Lancet*, 1916, xxxvi, 4.

The author considers that two great misfortunes may follow a fracture: non-union and deformity accompanied by disability. Various methods of correction for many of the deformities are discussed and cases cited that have been operated upon by the author and his associates, among which are osteotomy of deformity after Pott's fracture; nailing for fracture of the neck of the femur; nailing for elbow fracture; and bone-grafting for non-union.

The author believes that in every case of fracture of the elbow-joint, and in every case of Pott's fracture when reduction cannot be accomplished by manipulation, operation should be resorted to before new bone has commenced to form.

A. J. Davidson.

Beebe, E. L.: *Dislocation of the Semilunar Bone.* *N. Y. M. J.*, 1915, cii, 1186.

Since the advent of the X-ray, this peculiar dislocation has been diagnosed more frequently. Its importance rests on the difficulty of diagnosis, and permanent deformity with uselessness, pain, and stiffness resulting providing no treatment is adopted.

The dislocation is usually due to direct or indirect trauma. The direct causes are such as force applied to the back of the wrist, as blows from stones and implements. The indirect cause may be falling on the extended hand or when the elbow is fixed and force is made on the hand. On account of the anatomical position of the semilunar bone this lesion is very prone to occur.

The symptoms are pain, uselessness of the hand, deformity which varies with the stage of inflammation, more or less stiffness of the wrist, flexion of the fingers, and prominence on the front and a depression on the back of the wrist. Pronation and supination are not interfered with. The X-ray is necessary for diagnosis.

If the accident has occurred some weeks or months previous, the same symptoms will be present except

that the acute inflammatory condition will be absent. The treatment of a dislocated acromioclavicular joint if recent and no complication be present consists in reduction by manipulation, the method being traction in hyperextension with pressure on the displaced bone, after which the hand is placed in flexion and pressure maintained over the acromioclavicular joint. If the dislocation is compound or if manual reduction is impossible, excision is necessary.

If the dislocation has existed one or two months open reduction has been recommended, but the results from excision have proved most satisfactory, in that the patient regains good use of the part, except for slight limitation in adduction, abduction, and hyperextension. Pain disappears from the wrist permanently.

J. H. SHAW.

Ransohoff, J.: Dislocation of the Knee. *Lancet-Clm.*, 1916, CVI, 59.

Ransohoff adds three cases of dislocation of the knee-joint to the rather meager reports recorded in the literature.

The latest German tabulations show that in a little over 40 per cent of all cases of dislocation of the knee, the leg is dislocated forward, in about 20 per cent backward; in 20 per cent outward; and in about 2 per cent inward.

The author contends that practically all dislocations of the knee, unless attended by extensive fracture, are primarily either forward or backward. The lateral displacements and rotation of the leg which are occasionally encountered, he believes to be the result of a continuation of the force on the leg already dislocated. Anterior dislocations almost always occur while the limb is in extreme extension, and posterior dislocations while it is in flexion.

It is impossible to conceive of an anterior or posterior dislocation of the knee without the tearing off of one or both crucial ligaments; however, complete recovery of joint function in these cases is in marked contrast with the slow recovery which often attends seemingly less severe injuries of the knee-joint.

The most serious danger encountered is from damage to the blood-vessels in the popliteal space. In many instances the artery or the vein or both are torn, necessitating either primary suture or amputation. Laceration of the capsule and ligaments is usually so extensive in this injury that with little traction and manipulation reduction is readily accomplished.

R. B. CORFIELD.

SURGERY OF THE BONES, JOINTS, ETC.

Koerte, W.: Importance of Immobilization in the Treatment of Gunshot Wounds of Bones and Joints. (Ueber die Wichtigkeit feststellender Verfahren bei der Behandlung von Knochen- und Gelenksverletzungen). *Deut. Klin. Wochenschr.*, 1916, III, 1.

In civil surgery during the past few years there has been a marked tendency to substitute extension

treatment or massage and early movement for immobilizing dressings in fractures. This has been in vogue to such an extent that recent medical graduates do not even know how to apply a plaster cast well, but have to learn after going to the front. Even in effusions of blood into the joint, massage and early movement is practiced rather than immobilization of the joint. Even though this may be justified in civil practice, Koerte points out that immobilization is absolutely essential in injuries of the bones and joints in war. In the majority of cases the patients have to be transported before consolidation takes place, which not only causes them great pain, but increases the danger of infection by irritating the tissues with the loose fragments and reawakening latent bacteria. The more complete the immobilization the better the transportation is borne.

At the dressing station there is not time to apply casts, so splints must be used. Splints have been made of all sorts of material but wooden splints 2 to 3 mm. thick are best. Of the metal splints Crumer's wire splints are the best. These will do until the field hospital is reached when a cast should be put on, with openings for the dressing of the wound. The patient should be given 1.5 to 2 g. morphine while the cast is being put on, and if he is in great pain or if it is necessary to incise and cleanse the wound, light ether anesthesia is used. The stiffening of the joint, which is the chief objection urged against the plaster cast, can be very much limited by placing the leg in a slightly flexed position. The joint should also be moved every time the dressing is changed. As soon as the ends of the bone are united the plaster should be removed and exercises given the joints and muscles. The author has seen many cases that were doing badly under extension treatment and after the application of casts the suppuration subsided and consolidation progressed rapidly.

A. Goss.

Koerte, W.: Treatment of Infected Gunshot Injuries of Bones and Joints. (Zur Behandlung der infizierten Knochen- und Gelenksverletzungen). *Deut. Klin. Wochenschr.*, 1916, III, 30.

Infection is much more frequent in gunshot wounds than it was during the first month or two of the war. Some of the causes of this are beyond control. Infection is favored by the fact that the patients often have to lie on the damp ground for some time before their wounds are attended to at all; at the dressing station they often have to be laid on straw, which is dusty. Special care is necessary to prevent the wounds being soiled with dust. A third important factor, which is preventable, is that the limbs are often not sufficiently immobilized at the dressing station. Every movement of the ends of the bones increases the effusion of blood and wound fluid, and therefore the danger of infection. It is of great importance that patients with such wounds should not be transported until the bone is completely healed; but at the eastern

front this is almost impossible to carry out. The hospitals at the front do not have room to keep all the wounded so long, and cities with adequate hospital facilities are very few and at great distances from one another. Conditions are much better on the western front.

At the first sign of infection the wound should be opened up along its entire length, due consideration being given of course to anatomical structure. Drainage tubes should be introduced through counterincisions at the most dependent points. No pressure should be exerted to press out the wound secretion, as this only spreads the infection. This treatment should be given at the dressing station under light anaesthesia. For the first few days the wounds should be dressed daily. Chemical antiseptics irritate the tissues and do no good. In the stage of healing calcium chloride powder and balsam of Peru aid in the formation of granulations. Very large wounds with much suppuration should be left entirely open, the limb being covered with a wire net with gauze spread over it to keep out the dust. Bier's hyperæmia is recommended. The author has had no personal experience with it, but thinks it of value only in the beginning and only in hospitals where there are plenty of physicians and nurses; no such ideal conditions exist at the eastern front.

As a matter of fact the best part of the treatment is the prevention of infection, to which the utmost care and energy should be directed. A. GOSS.

Jaeger, C. H.: Flexion Deformity of the Knee; an Improved Method of Correction. *Am. J. Surg.*, 1916, xxx, 15.

The author describes his method and apparatus of correction of flexion deformity of the knee. The apparatus is really a home-made Goldthwait genuclast, consisting of plaster-of-Paris cuffs, steel bars, and long wooden handles. The minute detail of the apparatus does not lend itself easily to abstract form, and the reader should refer to the original article.

The method of correction is the ideal one, in that it prevents the subluxation of the tibia and fibula, and in this way may have some advantage over the Goldthwait genuclast. C. C. CHATTERTON.

Cook, A. G.: Operation for Relapsed Club-Foot. *Am. J. Orth. Surg.*, 1916, xiv, 9.

The author describes his operation of tarsectomy for cases of relapsed club-foot that have resisted the ordinary methods of treatment. There is no age limit, no preliminary treatment, and no after-treatment beyond the time required for the healing of the wound. The steps in the operation are as follows:

1. If necessary subcutaneously divide the fascia on the inner side of the foot and the tendo achilles, then bring the foot into as good position as possible using nothing but the hands and being careful not to bruise the tissues.

2. Make an incision through the skin and superficial fascia just in front of the external malleolus on the outer side of the foot. The skin incision should be perpendicular from the bottom of the foot to just above the bend of the ankle.

3. With an osteotome remove a large wedge of bone; make the first incision far back, just in front of the fibula. Pay no attention to the periosteum or peroneal tendons. Cut the bones completely across and remove everything.

The foot can then be brought without force into excellent position and by giving the anterior part of the foot a quarter turn its outer border can be elevated. Cook uses a light retention splint in preference to a plaster cast. He often allows young children to walk after two weeks. The dressing is worn from six to eight weeks when an ordinary shoe is fitted.

He has operated upon 30 patients during the past twenty years. Three feet relapsed, requiring secondary operation, probably because too small a wedge of bone was removed. One foot relapsed because the anterior portion of the foot was not sufficiently rotated and a sharp point of bone projected toward the sole of the foot. In one foot he removed too large a wedge of bone and the patient had a moderately pronated and flat foot. PHILIP LEWIS.

Gallie, W. E.: Tendon Fixation in Infantile Paralysis. *Am. J. Orth. Surg.*, 1916, xiv, 18.

In brief, the author's method consists in exposing and isolating the tendon, drawing it taut so as to correct the existing deformity and burying it in the bone in such a way that when healing takes place, the deformity cannot recur.

In cases of varus deformity the technique is as follows: A tourniquet is applied and a vertical incision is made over the external malleolus, about 2.5 inches in length, exposing the bone and the peroneal tendons. The tendons are carefully freed from their sheaths and are either split into several strands by longitudinal incisions or are scarified on their surfaces by numerous small transverse cuts. A longitudinal incision is then made through the periosteum on the outer aspect of the malleolus and shaft of the fibula, extending down past the epiphyseal cartilage to the tip of the bone. The periosteum is raised for about three-sixteenths inch on either side of this incision, and if the epiphysis consists of cartilage, a flake of cartilage is raised with a knife to correspond with the reflected periosteum. With a gouge of suitable size and shape a trough is then cut in the bone, the full length of the incision, and of sufficient depth to completely bury one of the tendons. A similar trough is prepared on the posterior surface of the malleolus subjacent to the groove normally occupied by the tendon. The foot is then held in an overcorrected position by an assistant. With the aid of a pair of Kocher clamps the tendon of the peroneus longus is drawn taut and laid in the anterior groove. At the lower end of the incision a medium-sized kangaroo suture is passed

twice through the tendon and cartilage of the epiphysis on either side and when this suture is tied it acts as a very effective anchoring stirrup. The peroneus is finally sutured over the buried tendon with catgut. This procedure is repeated in the case of the peroneus brevis. The incision is closed with catgut and horsehair and a plaster-of-Paris bandage applied over the dressings to hold the foot in the correct position. The plaster remains on from six to eight weeks.

In some cases where simple manipulation failed to obtain correction, in addition to the tendon fixation, arthrodesis was performed, sufficient bone being removed from the astragalonavicular and calcaneocuboid joints to allow of easy correction of the varus.

In some cases in which equinus is present as the result of paralysis of the dorsiflexors of the foot, in addition to paralysis of the peronei, the peroneal fixation should be combined with a fixation of the tibialis anticus tendon.

It is important that the tendons should be completely freed from the annular ligaments of the foot so that the tendon joins the point of insertion with the point of fixation in a straight line.

In cases of paralytic calcaneus the technique is similar except that the Achilles tendon is buried in the posterior surface of the tibia. After solid union has occurred a moderate lift is put on the heel of the shoe. When paralysis of the tibialis posticus is present in addition to paralysis of the triceps surae, the tendon of the tibialis posticus is drawn taut and buried in a groove in the internal malleolus.

In cases where there has been a partial recovery of the paralyzed muscles he performs fixation of half the tendon.

The author claims for his method, superiority over arthrodesis, because it eliminates motion only in the direction of the deformity; over tendon transplantation because of a much broader applicability and of much more certain success; over silk ligament installation because it is more direct and efficient.

He reports 120 operations by this method, all of which healed by primary union and, with the exception of 10 cases, the results were all that could be hoped for. Of the permanence of the results it is impossible to say more at present but the degree of benefit derived by the patient and the fact that the immediate improvement has stood the test of three years remove any hesitation on his part in recommending this form of treatment.

PHILIP LEWIN.

Leriche, R.: Resection for Injuries of the Elbow in War. (*De la résection dans les plaies articulaires du coude par projection de guerre.*) *J. de chir.* 1915, vol. 110.

Leriche believes that all gunshot injuries of the elbow should be treated by resection. It permits open dressing of the lesions, prevents infection or overgrowth if already established, and if followed up by correct after-treatment it insures almost normal mobility of the joint. Nearly always

wounds of the elbow joint, even if they appear slight, are infected, and if given the so called conservative treatment the patient is apt to undergo a long period of suppuration, ending finally in ankylosis. Primary resection is safer and in the long run more conservative.

Two directly opposite objections have been urged against resection, one that it is apt to be followed by ankylosis, the other that it results in flail-joint. When either of these conditions arises after resection it is due to defective after-treatment.

The details of the after-treatment are discussed, attention being called to the fact that massage and movements may be overzealous as well as lacking in the other direction. Cases are cited in which movements were kept up in spite of pain, resulting in inflammation and partial reankylosis.

The author has performed nine primary resections and has followed the cases for several months. There was not a single case of either reankylosis or flail-joint. Part of his success he attributes to the fact that he practices subperiosteal denudation of the muscles, thus preserving their normal attachments. The function of the new joint depends on the condition of the muscles. The classical method of resection should be followed, no matter where the entrance and exit wounds may be. The results are much superior to those of partial resections. The wound should not be sutured at all; but the arm should be dressed at an acute angle and placed in a wire trough. The plaster becomes softened with the discharge so that it does not immobilize sufficiently. If possible the first dressing should be left on for three days. From the fourth or fifth day the wound should be exposed to the sun without any covering.

The results of heliotherapy are remarkable. Suppuration stops almost completely after an exposure of an hour or two a day for three or four days, and the action of the sunlight is also analgesic. If there is no sunlight hot air is the best substitute. As soon as pain stops passive movements should be begun. They should never be vigorous or extensive enough to cause pain and should be kept up for only a few minutes at first. At the end of two or three weeks the wire splint is removed and the arm put in a sling and soon afterward the patient is encouraged to try active movements. At the end of about a month massage of the biceps and triceps should be begun. This after-treatment requires a great deal of time and patience, and it is advisable to treat a number of patients together so that emulation is aroused in making active movements and noting progress.

If an ankylosis has been allowed to form, secondary resection is indicated provided the muscles are not atrophied and the nerves uninjured and the function of the hand normal, particularly if the ankylosis is in a bad position. The author has performed 5 secondary resections and has had good results in all, with movement through 60 to 90° at the end of three months. It often takes two or three years

before normal movement is completely re-established. In all of the cases except one pronation and supination were restored.

A. Goss.

Sherman, W. O.: The Bone-planting Problem: Report of 200 Cases. *Internat. J. Surg.*, 1916, xiii, 2.

During six years with a fracture service of 3,100 cases Sherman has had to resort to plates in only 200 cases. Open operations are indicated in some cases, under the proper surgical environment. The teaching of extremists, who have advocated plating of all fractures of long bones, has resulted disastrously. The open operation is not a procedure for an "embryo surgeon." An acknowledgment that the majority of cases become infected and that in many cases the plates must be removed is no indictment against the method. Rather it is an evidence of faulty judgment in the selection of cases and gross errors in technique.

To properly do this work care and attention must be paid to the following factors:

1. The exclusion of the skin from the field of operation.

2. The proper armamentarium must be employed, and this is not possessed by the average hospital.

3. The cases must be properly selected. Ward patients who are anemic, alcoholics, luetic patients, as well as obese subjects are poor subjects for bone-planting operations.

4. The operation should be postponed from 10 to 12 days after the injury to give the tissues an opportunity to react.

5. It is seldom necessary to drain.

6. The autogenous bone-graft operation is the operation of choice in non-union cases.

The results of operation have been superior to conservative methods in properly selected cases, as is evidenced by the fact that permanent disability in these cases has been reduced.

The author does not advise operation in any case until all other methods have been tried and found wanting.

ISIDORE COHN.

Hawley, G. W.: The Fate of Bone-Grafts. *Am. J. Orth. Surg.*, 1916, xiv, 20.

The author endeavored to stabilize the ankle in paralytic deformities of the foot by the use of bone-graft. The graft was inlaid vertically in a gutter cut in either the anterior or posterior surfaces of the tibia and astragalus. Technically, this provided ideal conditions because it brought periosteum to periosteum and endosteum to endosteum.

In calcaneo valgus deformities the graft was placed across the front of the joint in order to check dorsal flexion more effectively. In equinovarus cases the inlay was placed on the posterior surface in order to lock plantar flexion.

In most of the cases the lower end of the graft was carried down to and into the os calcis. In all of the cases it was possible to mortise the transplants in

so tightly that they could be removed only with difficulty, and no sutures were required to hold them in place. Post-operative immobilization in plaster was carried out over a period of from eight to twelve weeks.

In the six cases reported the results were as follows:

In a girl of eighteen, nine months after operation atrophy of the graft was found at the point where it bridged the joint. Where it was embedded in bone it was as dense as ever. The atrophy increased until a year later the dissolution was complete and joint motion returned.

In a patient aged five years, ten months after operation complete atrophy of the graft opposite the joint was noted.

Cases 3, 4, 5, and 6 showed similar changes.

Those parts of the graft inlaid in bone remained vigorous and strong, while only those portions opposite the joint atrophied. Recurrence occurred in 5 of the 6 cases; in one case ten months after operation, in three within twenty-one months after operation, and in one case the date of the recurrence was not known.

PHILIP LEWIS.

Ritschl, A.: Ten Rules for Amputations of the Lower Limbs (*Zehn Regeln fuer Amputationen an den unteren Gliedmassen*). *Med. Klin.*, Berl., 1915, xi, 1275.

Ritschl gives the following ten rules for amputations of the lower limbs.

1. It is of great importance that the stump should be capable of bearing the weight of the body; this keeps it strong as well as avoiding artificial supporting surfaces, which are of less value.

2. A circular incision seldom gives a weight-bearing stump, because it makes the scar pass across the end of the bone.

3. Whenever possible flap methods should be used, care being taken to make as small a scar as possible on the lateral surface of the stump.

4. By removing the periosteum and bone-marrow for 1 to 2 cm. the stump can be made painless.

5. As soon as the wound is healed the stump should be hardened with baths, alcohol rubs, massage, and using it on crutches.

6. The muscles of the rest of the limb should be strengthened by active gymnastics, and the joints should be kept active by passive movements.

7. As soon as possible the patient should be provided with an artificial limb.

8. If the amputation was above the knee the artificial leg should be provided with a knee-joint.

9. The uninjured limb must be kept from atrophy by gymnastic exercises while the patient is in bed, as greater demands than usual will be made on it later.

10. For the same reason any decreased functional capacity of the uninjured limb should be given special attention and treatment, such as active gymnastics and orthopedic treatment for actual or threatened flat-foot.

A. Goss.

Hana, H.: Technique of Secondary Plastic Operations on Amputation Stumps (*Zur Technik der sekundären Hautlappenplastik bei Kriegsamputationen*). *Med. Klin., Berl.*, 1915, 11, 1799.

Many circular amputations have to be done at the front and the patients are sent to the hospitals in the interior with directions to reamputate or do a plastic operation. The author prefers the latter as it avoids a secondary mutilating operation and he has had the best of results. If the amputation is in the upper part of the humerus he brings the stump over against the thorax, marks out a flap on the skin of the desired size and shape, dissects up the flap of skin and fascia except at its base, covers the stump with it, bandages the arm to the side, treats the wound antiseptically, and after about ten to fifteen days separates the base of the flap.

The procedure is the same in other amputations and illustrations are given showing the points at which the skin flap is most conveniently made in various sorts of amputations. Massage of the stump should be begun early so as to make the flap freely movable over the stump. The fascia unites with the muscles on either side of the bone and enables the antagonistic muscles to act normally, and as the result of active use a sort of mucous bursa finally develops, such as exists normally over other points of pressure, for example, the olecranon. The operation in itself is simple, but it demands careful and patient after-treatment. A. Goss.

Goat, O.: Contribution to the Osteoplasty of the Extremities (*Beitrag zur Osteoplastik der Extremitäten*). *Beitr. z. Klin. Chir.*, 1915, 125.

Of 315 cases reported in the literature, autografts was performed in 220, or 69 per cent. Of these 120 cases, 68.5 per cent are reported cured. Homografts was used in 21.5 per cent, with 26 per cent cured. Heterografts was performed in 11 per cent of the total number of cases, the statistics showing 76 per cent cured.

The author reports 2 cases of sarcoma of the upper end of the tibia in which resection and later an autoplasmic transplantation, by means of a splint taken from the other tibia, were performed. Good results were obtained, and the patients were able to walk without support, especially in the first case, a boy of four years. In the second patient, aged seventeen, the result was somewhat impaired by the formation of a pseudarthrosis at the upper end of the implant. As far as the epiphyseal cartilage is concerned, the first case shows that the irritation caused by the implant acts as a stimulus for epiphyseal activity, and rather enhances the growth. A. STEINER.

ORTHOPEDICS IN GENERAL

Langnecker, H. I.: Lesions of the Lumbosacroiliac Region: a Study of the Various Types. *J. Am. M. Ass.*, 1915, 16, 1666.

The author calls attention to the close functional relation between the lumbosacral and the sacro-iliac

articulations. He divides the lesions in this region into three classes: (1) traumatic, (2) static, and (3) toxic.

The traumatic class is further subdivided into the acute and the chronic. In the latter the trauma may be recurrent. Examples of the acute lesion are seen in strain during lifting, childbirth, anæsthesia, etc. The pain is sharp and increased by movement and is localized over the sacro-iliac joints or radiates down the leg.

In the chronic type relaxation, occasional displacement and adhesions are present. Flattening of the lumbar spine is present in both types. In the postural type relaxation of the muscles and ligaments plays the chief rôle, the lumbar curve is increased, and the pelvis is tilted forward.

Contrary to the two types first mentioned, the lesion in the latter is usually bilateral. General debility, anatomic variations, incorrect clothing, faulty weight-bearing conditions, and pregnancy may be factors. In the toxic type the symptoms are of gradual onset. There is much limitation of motion and while pain is apt to be more localized it may be referred up the back or down the leg. In concluding the author states that differentiation of the various types is not difficult if one bears in mind the fact that in the traumatic group injury with a sudden onset of symptoms is most important. In the static group the defect of posture with marked relaxation of the joints is present, and in the toxic group the history of an inflammatory process with a tendency to fixation of the joints is found.

F. J. GARDNER.

Cooley, E. L.: Deformities of the Foot; Static Foot Trouble. *J. Mo. St. M. Ass.*, 1915, 18, 10.

It would be expected that the predisposing causes of static foot troubles such as weak, flat, abducted, and pronated feet and a rational line of treatment would be well established among the profession at this late day but unfortunately such is not the case. Routine measures, especially in the diagnosis and treatment of these conditions, is the order of the day. One justly famous orthopedic surgeon never employs a foot brace of any kind in treating these deformities, while another equally famous orthopedic surgeon never treats a case of faulty weight-bearing without the use of flat-foot plates. The routine varies and different routines have different results, but the evil of routine treatment exists in all. Every case of static foot trouble, of whatever kind, is a law unto itself and demands the same individual differentiation accorded by the oculist to those suffering from defective vision. The author discusses very thoroughly the causes, symptoms, pathology, diagnosis, and treatment of these conditions. R. B. CHASE.

Martin, W.: Flat-Foot: Its Relation to Neuritis and Its Treatment. *Med. Rev.*, 1915, 19, 101.

The author reviews the symptoms, the anatomy of the arch of the foot, his treatment of flat-foot,

his treatment of neuritis, and reports several cases of this condition.

He believes that there has been little attention paid to the result of fallen or relaxed arches upon the sciatic nerve. Many patients with flat-foot may complain of pain in the back, along the sciatic nerve, as well as pains in the arch and ball of the foot. He believes that often the neuritis may be the cause of the flat-foot, and that the neuritis is primary. The anatomy of the foot is reviewed in some detail.

In the description of flat-foot, he lays great stress

upon the turning out of the os calcis. The neuritis is determined by electrical reaction and tenderness over the nerve. In the treatment, if the arch is only relaxed, exercises for the feet and care of the neuritis will usually bring about a cure. If the arch is flat plates are made which tend to rotate the os calcis. Exercises should be continued at least a year.

For the neuritis he uses static electricity and hot applications; all obvious sources of infection are cleared up and diet and toxic intestinal conditions are looked after.

C. C. CHATTERTON.

SURGERY OF THE SPINAL COLUMN AND CORD

Landry, L. H.: Extraction of Exploring Needle Broken in Attempting to Do a Spinal Puncture for Diagnostic Purposes. *N. Orl. M. & S. J.*, 1915, lxxviii, 404.

Cases of foreign bodies in the spinal canal are infrequently reported. The case Landry cites had a needle broken off so that the end was in the spinal canal. The man complained of severe headache and pain radiating down the thighs, and in the back on flexing the spine. X-rays located the needle, which was extracted after half an hour's search after removing the spinous processes of the third, fourth, and fifth lumbar vertebrae. The patient was able to walk in a week.

Landry concludes that in exploring, the patient should be warned not to straighten up; the skin should be incised; a platinum or at least a bright needle with a short point should be used and the course of the puncture anesthetized.

C. A. STONE.

Schoenbeck, O.: Dangers of Lumbar Puncture (Die Gefahren der Lumbalpunktion). *Arch. f. klin. Chir.*, 1915, cvii, 309.

Quincke first proposed lumbar puncture in 1891 for hydrocephalus. Since that time the indications have been extended to a number of other conditions, and it is used for diagnostic even more than for therapeutic purposes. But it is not without unpleasant by-effects, a number of which are described, and in a considerable number of cases it has caused death. Schoenbeck gives the histories of 71 such cases that he has collected from the literature and says that perhaps many have occurred that are not reported. He gives a bibliography of 137 titles.

Among the author's cases there were 37 of intracranial tumors, 2 of cysticercus, and 1 of echinococcus cyst; that is to say, in 40 cases there were conditions that decreased the size of the intracranial space.

The other cases were: hemorrhage 13, uræmia 4, meningitis 7, prolongation of the cerebellum into the foramen magnum 2, acute myelitis 1, cerebellar

abscess 1, pneumonia in a rachitic child 1, tumor of the cervical cord 1, anemia of the brain and edema of the lungs 1.

It has been said that the serious consequences of lumbar puncture are due to removing too much fluid, but in 15 of these cases less than 5 ccm. was removed, which is less than the amount considered necessary for diagnostic purposes. In 7 of the cases death occurred during or immediately after the puncture, and in the others after intervals varying from a few minutes to several days. There was generally a great fall of pressure after the puncture—in one case amounting to 60 mm. Hg. after the removal of only 30 ccm. fluid. In some of the cases there were doubtless defects in technique, but deaths have occurred with the most careful technique.

It would seem from the reports that though lumbar puncture is harmless in the healthy it may have the most serious consequences in pathological conditions, particularly so in cases of hemorrhage into the skull or vertebral canal and in intracranial tumors. Caution should also be observed in cases of uræmia, inflammatory conditions of the central nervous system, brain abscess, arteriosclerosis, and suppurative meningitis.

In cases of intracranial tumor certain precautions should be observed. The patient should rest in bed for twenty-four hours before the puncture; he should lie on his side with the head low during the puncture; close watch should be kept over the changes in pressure in the fluid; the patient should rest in bed afterward for twenty-four to forty-eight hours, with the head lowered for the first twelve to twenty-four hours; alcohol and all excitement should be avoided after the puncture and the transition from the lying to the erect position should be gradual. These precautions, except as to keeping the head low, should be observed in all punctures. Aspiration or ambulant puncture should never be attempted. The dangers consist chiefly in producing a hemorrhage into the vacuum created and in obstructing the communication between the cavities.

A. Goss.

Fearnside, F. G.: Gunshot Wound of the Lumbar Spine; Injury to the Cauda Equina; Destruction of the Pelvic Autonomic Nerves; Paralysis of the Large Intestine and Rectum; Recurrent Attacks of "Intestinal Obstruction." *Proc. Roy. Soc. Med.*, 1915, 10, *Neural. Sect.*, 32.

Fearnside reports a case of gunshot injury to the cauda equina occurring June 22, 1915, in which the coccygeal and sacral roots were injured on both sides; the fifth lumbar roots of the left side also suffering slightly. The chief interest was in the abdominal symptoms which subsequently developed.

The patient came under the author's care twenty-five days after the injury. At that time he suffered from incontinence of urine and faeces and other evidence of injury to the sacral nerve roots.

The following month brought no material change in the signs of nervous interference. On August 14th, the patient complained of abdominal discomfort and was restless and irritable. There was tenderness in the right lower quadrant. The following day the pulse-rate rose from 80 to 130, the abdomen became distended, and the patient began vomiting. On the fourth day he presented "abdominal facies;" the abdomen was distended and rigid in both iliac fossae. The abdomen was opened. The appendix and peritoneum appeared normal. The large intestine, the transverse and descending colon particularly, was distended. The cecum contained much gas and the lower ilium contained fecal masses.

The abdomen was closed. A large fecal accumulation was removed by the use of high enemata and mechanical digging. This was followed by marked improvement.

During the following three months the patient suffered three other attacks of "pseudo-obstruction" with intervals of from four to six weeks. Each attack occurred after a period in which the bowels were acting normally as regards frequency, quantity, and appearance of the stool.

The author called attention to the nerve supply of the intestine: (1) that portion above the transverse colon being supplied from the lower thoracic nerves through the splanchnic nerves; (2) the remainder being supplied by the pelvic autonomic outflow from the post-pelvic portion of the sacral roots in which region there is unequivocal evidence of gross injury. The afferent fibers, running through the posterior root ganglia, having escaped injury as evidenced by the referred pain and tenderness along the ninth, tenth, eleventh, and twelfth thoracic nerves.

G. D. THIBALD.

Wolcott, W. L.: Pott's Disease Treated by Operation; a Report of Six Hundred and Eighty-Two Cases. *J. Am. M. Ass.*, 1916, lxxv, 128.

Statistics on the operative treatment of Pott's disease were secured by Wolcott by sending a questionnaire to the various surgeons in this country who were interested in and had done either the Albee or the Hibbs' operation. Sixteen surgeons

reported 642 cases. Of the total number of cases, 128, or 20 per cent, were benefited by the operation. Abscesses were present at the time of operation in 28 cases, in 7 of which improvement was reported after operation. In only 5 instances was there post-operative development of abscess. Paraplegia was present at the time of operation in 13 cases, in 7 of which there was improvement, but later there were recurrences in 2 cases, in the other 6 there has been no post-operative improvement of the paraplegia to date. Paraplegia developed after operation in 3 instances. There were 30 deaths, or approximately a mortality of 5 per cent; the disease in 6 of these cases was reported as having been arrested at the time of death. The causes of death were given as follows: tuberculous meningitis 7 cases, pulmonary tuberculosis 3 cases, military tuberculosis 5 cases, pneumonia 1 case, septic meningitis 1, fat embolus 1, status lymphaticus 1, acidosis 1, and pyemia 1. In the remaining cases the cause of death was not given.

Of the 16 surgeons reporting, 12 considered post-operative support necessary and considered the operative procedure as a most valuable aid to the treatment of Pott's disease in selected cases. Four considered the post-operative support unnecessary after the period of recumbency, accepting Albee's idea that a certain amount of motion would stimulate and hasten the formation of ankylosis.

After a careful consideration of the facts obtained from various sources Wolcott concludes that these operations in a large percentage of cases abbreviate the treatment of tuberculosis of the spine by definitely hastening the curative ankylosis so necessary in this disease, and the likelihood of an increase in the deformity is proportionately decreased. These operations are best adapted to the treatment of Pott's disease involving the cervicodorsal, dorsal, or dorsolumbar regions.

R. B. CORFIELD.

Davidson, A. J.: Bone Transplantation in Pott's Paralysis. *Therap. Gaz.*, 1915, lxxvii, 761.

The author reports the case of an adult with motor paralysis progressive for five months in which he did a transplantation of bone-graft, after the method of Albee. He used the ordinary technique except that he used a table with canvas by means of which the patient was put in a hyperextended position during the operation. The patient was put in a plaster jacket and has been supported by apparatus since.

The patient was able to move both feet and thighs on the second day after operation, and in four weeks he was able to walk with slight assistance. Ten months after the operation the patient was in fine condition.

J. O. WILSON.

Hodgson, F. G.: Congenital Deformities of the Vertebrae and Ribs. *Am. J. Orth. Surg.*, 1916, xiv, 34.

The author quotes Pott's classification as follows:

1. Numerical variations concerning the column itself as a whole.

2. Morphological variations concerning the individual elements of the vertebral column in their form.

3. Numerical plus morphological variations.

4. Faulty differentiation concerning not only the metameric but also the regional differentiation including the cervical rib and sacralization of the fifth lumbar.

5. Pathological variations including spina bifida etc.

A costal anomaly is inseparably connected with a vertebral anomaly. The converse, however, is not necessarily true, for many cases are found with anomalies of the vertebrae but no anomaly of the ribs.

Congenital elevation of one or both scapulae is also a condition sometimes found in connection with abnormalities of the vertebrae or ribs.

Four cases are reported and demonstrated by photographs and drawings.

The first case was a maldevelopment of the seventh cervical to sixth dorsal vertebrae, with fusion of the third and fourth ribs on the right side.

The second case was a maldevelopment of the first to tenth dorsal vertebrae with eleven ribs on one side and thirteen on the other.

The third case was a severe maldevelopment of practically all the vertebrae, with many ribs on both sides showing fusion and maldevelopment.

The fourth case was a severe maldevelopment of practically all the vertebrae and many of the ribs.

Hodgson thinks that many of the cases of structural scoliosis, scoliosis sciatica, painful back, etc., may possibly be due to some mild unsuspected congenital anomaly.

PHILIP LEWIS.

Schanz, A.: Objective Symptoms of Insufficiency of the Vertebrae (Objektive Symptome der Insufficienciae Vertebrae). *Arch. f. klin. Chir.*, 1915, cvii, 286.

By insufficiency of the vertebrae Schanz means a disturbance in the static balance of the spinal column—an inability of the column to support a normal weight or an overburdening of it that overthrows the normal balance. This disturbance of balance is accompanied by definite objective symptoms, most prominent of which is contracture of the long muscles of the back, eventually followed by contractures of other muscles. There is also inability to move the spine freely, the patients show a disposition to look for some artificial support and finally the vertebrae may assume deformed positions. The details of 40 cases are given with numerous illustrations. The contracture of the long back muscles is manifested in the illustrations as two long rolls running parallel to the spinal column. They can easily be distinguished in the picture from normal back musculature. The difference is even more evident on palpation; the normal muscles are soft and elastic, while the contracted muscles feel like

firm, hard columns. Though this contracture is not mentioned in the textbooks, Schanz states that it shows plainly in the cases of spondylitis. It is not characteristic of spondylitis, however, but appears in any condition where there is a disturbance of static balance. The treatment of course is to endeavor to restore the normal balance, and if the treatment is effective this fact will be indicated by the gradual disappearance of the objective signs described.

A. Goss.

Els: Anomalies of the Sacro-Iliac Region in the X-Ray Picture (Anomalien des Iliosacralgebietes im Roentgenbilde). *Beitr. z. klin. Chir.*, 1915, xcv.

In many instances of persistent backache, lumbago, and sciatica the author was able to demonstrate in the X-ray pictures distinct anatomical anomalies as the cause of the disturbances. This was especially true in instances of spina bifida occulta in fissures, and in incomplete fusion of the halves of the neural arches. Anomalies of the fifth lumbar and of the first sacral vertebra were also recognized as underlying pathological conditions.

In two cases a distinct spondylolisthesis with forward tipping of the body of the fifth lumbar and kinking of its neural arch was found. The pain in uncomplicated spina bifida occulta is usually localized around the sacrolumbar junction, but it not infrequently radiates into the gluteal and sciatic regions. An enlargement of the transverse process of the fifth lumbar may also be the cause of pain, due to pressure upon the nerve-roots. Suspicion of developmental anomalies of the sacrolumbar region may be aroused by weakness of the bladder, or by nocturnal enuresis. Local signs, as coccygeal dimples or retractions, are likewise important. The author makes extensive reference to the well-known investigations of Goldthwaite on sacrolumbar disturbances. Special consideration is given to the enlarged transverse process, secondary nearthrosis combined with arthritis deformans, formation of bursae, etc., as etiological factors.

A. STEINBERG.

O'Brien, F. W.: A Non-fatal Fracture of the Axis. *Boston M. & S. J.*, 1916, clxiv, 85.

The author reports a case of fracture of the second cervical vertebra. The history was of a boy of seven who fell from a tree striking on his back. He was seen five days later. There was nothing remarkable about the child on examination except his carriage. No reflexes were disturbed. There was no paralysis of any muscle or muscle groups. Sensation was unimpaired. He was unable to move his head without pain, except by supporting his head with his upturned hand along the ramus of the jaw. This position made some motion possible. An X-ray showed a complete fracture of the laminae of the axis. A support was worn for five weeks after which a second X-ray showed good union. The child now plays about as well as ever.

L. T. BROWN.

SURGERY OF THE NERVOUS SYSTEM

Troell, A.: Some Attempts to Produce Experimentally Conditions of Sympatheticotonus, Vagotonus, and Hyperthyroidism. *Surg. Gynec. Obstet.*, 1916, xix, 51.

In order, if possible, to transmit and accumulate to the sympathetic and autonomic nervous system, respectively, for any length of time, the stimuli which are conducted from the central nervous system to the periphery through the phrenic nerve, and thus to produce conditions of sympatheticotonus and vagotonus, respectively, the author performed a number of nerve operations on dogs, cats, and rabbits. He cut the nerves in question in some animals in the neck, in others in the thorax. Then he joined with end-to-end suture the proximal end of the phrenicus with the distal end of the sympatheticus.

The animals, operated upon, were kept alive and controlled from 30 to 175 days after operation. The general condition, weight, pulse rate, sugar tolerance, eye symptoms, etc., were examined and compared. But the results thus obtained did not show any symptoms which were unquestionably indicative of conditions of sympatheticotonus, vagotonus, or hyperthyroidism. Equally unsatisfactory were the macroscopic and microscopic findings in the organs at autopsy. It was never possible to note any agreement between the various individual cases along the lines of the operations performed. In part, the reason for this may be that so many different kinds of nerves were united, as those from the cerebrospinal system and from the sympathetic system (though a histological union of the axones had been brought about), also it is not to be denied that, in severing the phrenicus, centripetal communication and transmission through that nerve had been broken.

Gilpin, S. F., and Farley, T. B.: Drainage of Cerebrospinal Fluid as a Factor in the Treatment of Nervous Syphilis. *J. Am. M. Ass.*, 1916, lxxv, 276.

Arsenic and mercury in the blood do not give good results in nervous syphilis. This is due to the fact that these drugs are not found in the spinal fluid when given by mouth, skin, or blood-vessels. In investigating the reasons for this, one is handicapped by the lack of knowledge of the origin and function of the cerebrospinal fluid. The source of the fluid is thought to be from the choroid plexus and the cerebral capillaries; its function is probably to protect the nerve-centers and to prevent the effects of concussion, serving no lymphatic function. Frazier and Peet found that the cerebrospinal pressure varies with the pressure of the blood in the venous sinuses and is practically identical with it.

The same mechanism which prevents the entrance of many substances normally found in the blood into the cerebrospinal fluid is probably responsible

for the failure of arsenic and mercury to enter the subarachnoid space. It was thought reasonable that if the pressure in the cerebrospinal cavity was reduced it might be possible to bring foreign substances through the capillary wall and thus secure the direct effect of such drugs on the nerve tissue itself. In doing this the patients were drained, when possible, once a week, as much fluid as possible being allowed to run out, from 30 to 40 c.c.m. No bad results were noted. One case was drained fourteen times.

Three patients were treated by mercury incisions and cerebrospinal drainage, one having received serosalvarian intraspinally but without improvement. All three patients improved under drainage, and while it is admitted that three cases prove nothing, yet it is believed that there was enough improvement to warrant a report in order to stimulate further work. The reflexes were not helped but the mental and physical health and the ataxic symptoms were.

E. K. ARMSTRONG.

Souttar, H. S.: Division of Right Anterolateral Tract of the Cord for Relief of Pain in Tabetic Crises. *Proc. Roy. Soc. Med.*, 1915, ix, *Neural Sect.*, 38.

Souttar relates the history of a case of tabes in which the crises became progressively more frequent and more painful during a period of four years in spite of active antisyphilitic treatment. The attacks were there rendered comparatively painless by division of the right antero-lateral tract.

When first seen the patient suffered an attack of abdominal pain and vomiting every one or two months and was incapacitated for the one or two days of their duration. There were irregular areas of diminished cutaneous sensation in various parts of the body. At the end of the four-year period the attacks were continuous with only an occasional day of freedom. They were accompanied by severe headache. The pain was limited to the left abdomen and the left leg, the hyperæsthesia was more extensive and more marked upon the left side, chiefly over the distribution of cervical 2, 3, 4 and 5, thoracic 11, 12, and sacral 1, 2, 3, 4. The knee-jerks were obtained sometimes readily and sometimes with difficulty.

At operation, the patient was placed in a prone position; the upper three dorsal arches were removed exposing about two inches of dura which was opened by a median incision. Silk threads were passed round the posterior roots of the second and third dorsal nerves and the cord rotated, bringing the right lateral surface into view. With a special triangular blade an incision, 2 mm. wide and 2 mm. deep, with its posterior extremity 3 mm. in front of the line of origin of the posterior roots and midway between the origin of the first and second dorsal

roots from the cord, was made in the cord. The patient suffered a very moderate degree of shock.

There was no paralysis following the operation and only slight post-anæsthetic vomiting. There were no changes above the point of operation. Below that point, the sensibility of the right leg was greatly diminished; the left side of the body and the left leg were entirely insensitive to pin-prick. In the same area cotton wool touch was perfect, heat and cold perfectly distinguished, and painful heat instantly felt as pain. Localization and joint sense were perfect. The knee-jerks were barely obtainable; the plantar reflex was downwards.

During the month following the operation there was great diminution in the areas highly sensitive to pin-prick, including that above the level of operation. The patient had only two attacks of vomiting accompanied by severe headache, no other pain.

Thoele: Injuries of Peripheral Nerves in War (Kriegsverletzungen peripherer Nerven). *Beitr. z. klin. Chir.*, 1915, xcvi, 131.

Thoele devotes 125 pages to an exhaustive discussion of nerve injuries during the war. He has operated upon 46 cases. He found that in about half of his cases the nerve was completely severed, a higher percentage than is given by most authors. The radial was injured more frequently than any other single nerve. It was impossible to tell clinically whether the nerve was completely severed or not.

The results of 48 operations are reported; two patients were injured in two different regions and had two different operations performed. Neurolysis was performed in 17 cases, 9 simple and 8 complicated. In the 9 simple cases there were only two complete recoveries. In a third case the paralysis of the ulnar recovered, but with contracture of the third to the fifth fingers. In 3 more cases there was marked improvement which will eventually probably be complete recovery. There was slight improvement in one case and no improvement in 2. Of the 8 complicated cases there was slight improvement in 4 cases and very marked improvement in 4.

In 11 cases of complete severing of the nerve the ends were freshened and sutured. There was improvement in only 4 of these cases; complete recovery in none. In 10 cases the nerves were cut and sutured on account of spindle-shaped thickening; they were only partially severed. There is beginning motor improvement in 3 cases, and improvement in the electrical reaction in 2, though paralysis is still complete. The time is too short to judge of the other cases. In 5 cases the gap was bridged with flaps from the peripheral end of the wounded nerves. In one case there was only slight improvement. In 4 cases the fibers were separated and the injured ones sutured, with 2 positive and 2 negative results. In one case the peripheral end of the injured peroneal was implanted into the tibial which was also paralyzed from pressure by cicatricial tissue. There was no recovery of the motor power

of the peroneal, though sensation was restored; the tibial recovered after neurolysis.

In general Thoele believes that when there is motor paralysis with partial reaction of degeneration it is best to wait six to eight weeks after the wound is healed in the hope that motility will be restored. In complete motor paralysis and complete reaction of degeneration operation should be performed as early as possible. Of course this may mean a delay of some weeks for the wound to heal, especially if there is suppuration. By early operation he means only as early as possible under aseptic conditions. This may mean from three weeks to three months after the injury. In partial paralysis with partial or complete reaction of degeneration it is best to wait 6 to 8 weeks after the healing of the wound. Operation should be performed as soon as possible in cases where there is extreme pain.

Operation should be done under general anesthesia. There is apt to be secondary hæmorrhage after local anesthesia and, moreover, the electrical reaction of the nerve cannot be tested during the operation if it is infiltrated with novocaine. He prefers not to cut off the circulation with the Esmarch bandage, because when it is applied vessels are overlooked, which cause secondary hæmorrhage and lead to the formation of scar tissue again. The incision should be made in such a way that the skin sutures do not come over the nerve-sutures. If this cannot be avoided a flap of fat or muscle should be interposed over the nerve. Many surgeons make a sheath of fascia around the nerve, and various other substances have been proposed for these sheaths, such as calves' arteries, pieces of vein, rubber tubes, etc. Thoele believes that these sheaths contract and cause adhesions and strangulations of the nerve, so he thinks it is better to use only a flat flap of muscle or fat, not enclosing the nerve in a sheath. The different bundles of the nerve have different functions, so it is important to bring the corresponding bundles together in suturing. The nerve should be spared manipulation as much as possible. In seizing it with forceps only the nerve-sheath should be grasped, not the nerve substance. When nerves have to be held aside it should be done with strips of gauze, not with instruments. The sutures should pass only through the epineurium. The stumps must be brought together without tension. Three or four button sutures are enough. Better adaptation is obtained with these than with a circular suture of the sheath. It is well to flood the nerve after suture with a 0.5 per cent novocaine-suprarenin solution. The limb should be placed in the best position to relieve the nerve from tension and it should be kept in a plaster cast for three to four weeks. When the gap is too great to admit of direct suture a flap is made from the injured nerve itself or from another sensory nerve. Where the nerve is only partially severed the author does not advocate complete section and suturing, but dissociation of the nerve-fibers and suture only of the injured ones, leaving the uninjured ones intact.

The after-treatment consists of electrical treatment with the galvanic current, for the faradic current has no effect; mechanical exercise; and local baths of various kinds. Neuralgia is not always overcome by neurolysis. Heile thinks that excision of the perineurium is of value in neuralgia. In severe cases of neuralgia in mixed nerves where neurolysis has not been effective Thiele resorts to the sensory tracts from the nerve-trunk. In purely sensory nerves he resorts and sutures if there is scar tissue, or resorts to a piece of the nerve and bridges the gap with a flap from the peripheral stump. A. Goss.

Hittroff: Sheaths for Nerves After Suture (*Umhüllung des Nerven nach der Naht*). *Deutsche med. Wochenschr.*, 1913, 39, 1388.

At the site of the lesion the nerve is embedded in scar tissue that gives a grating sound under the

knife. To prevent adhesions with surrounding tissues the nerve must be invested with a sheath around the sutured place. Hittroff made experiments on dogs with anatomical results as follows: When the nerve was sutured and no sheath put around it, in three months it was surrounded by thick scar tissue. When a sheath was made of calves' arteries the nerve was free but the artery was loosely adherent to the surrounding tissues. Muscle-flaps became transformed into scar tissue, to which the suture place was adherent. Fat sheaths protected the sutured nerve but became adherent to the surrounding tissues. Treatment with roentgen rays after the nerve had been sutured and sheathed in these various materials had no visible effect. When a sheath was made of a celluloid-like material it healed by first intention and the nerve remained freely movable. A. Goss.

MISCELLANEOUS

CLINICAL ENTITIES — TUMORS, ULCERS, ABSCESSSES, ETC.

Martin, W.: The Significance of Foreign Bodies in the Tissues. *Ann. Surg.*, Phila., 1910, 50, 74.

Having in mind the very different significance of foreign bodies as a complication of gunshot injuries in modern warfare and as seen in civil practice, Martin reviews the known facts regarding the action of foreign bodies in the tissues in the absence of infection, as well as their action in the presence of infection.

Soft and absorbable foreign bodies are gradually dissolved and are taken up by the tissue-cells. Compact and insoluble foreign bodies are shut in by a connective-tissue capsule of new formation. No foreign bodies are chemically and physically indifferent to the tissues. The most characteristic cells in the reaction of the tissues to foreign bodies are the so-called foreign-body giant cells; they are frequently seen in scar tissue, around particles of thread, etc., and in some instances they resemble tuberculous tissue.

Foreign bodies are capable of changing their position in the tissues as well as being carried by the blood stream.

The tissues react differently to different substances: glass produces almost no reaction; copper produces a great irritation; silver the least of all the metals. The infected foreign body acts as a focus of infection because of the organisms introduced with it. It should be removed. Notwithstanding the wide difference between "war surgery" and "peace surgery," the author concludes: "Large incisions properly placed for drainage, removal of detritus, detached fragments of bone and tissue and all absorbable foreign bodies, flushing the wound with H₂O₂, etc., has become the routine treatment for severe wounds."

JAMES COSS.

Lillenthal, H.: A Surgeon's Education in Cancer: Conclusions After Nearly Thirty Years of Clinical Observation. *Maryland M. J.*, 1910, 19, 1.

The author compares the present state of cancer surgery with that of thirty years ago. There is now "the presence of justified hope, where before there was a feeling of helplessness." He calls attention to the markedly better results obtained in mammary cancers, largely due to the earlier stage at which they are seen, and the extension of the operation to include removal of the pectoral muscles and removal of the axillary glands.

Stomach and intestinal surgery was rare thirty years ago. He now believes that in a subject over forty years of age we should operate for "persistent indigestion," and so eradicate many cases of early gastric cancer.

In regard to cancer of the thoracic esophagus, he mentions the classic recovery of Torek's case, and has confidence that success is a matter of time and the advance of technical methods.

In hypernephroma a solitary metastasis, if removed at the time of nephrectomy, will give a good chance for a long period of relief, and he feels that if no inoperable secondary tumor exists, multiple metastases when easily removable, should not forbid nephrectomy with the simultaneous extirpation of the metastasis.

He advocates the use of Coley's fluid in sarcoma, in the inoperable cases, and after the extirpation of the growth.

In speaking of the clinical and laboratory diagnosis at the time of operation he advises the cautery knife for removing a specimen for examination. To spare the patient a hopeless and dangerous operation, he found useful the removal of a distant node, and in suspected gastric cancer, he has excised a lymph-node from the supraclavicular region.

This is commonest on the left side and he suggests that its presence may be accounted for by the proximity of the principal lacteal duct.

We are still confronted with two tragic obstacles. The first is the layman's fear of operation in cancer, and the second is the inexcusable attitude of procrastination which is still maintained by so many in the medical department of our profession.

D. L. DESPARD.

Bristol, L. D.: An Enzyme Theory of Cancer Etiology. *Med. Rec.*, 1916, LXXIX, 180.

Bristol attempts to harmonize the origin of cancer with the activity of enzymes. According to his theory, the first step toward a malignant proliferation is usually found in cell or tissue injury. This may be caused by physical, chemical, functional, nutritional, or infective agents, such as trauma, heat, X-rays, drugs, toxins, acids, and alkalis, or by chronic infection. In general, cancer follows injuries whose agents have their effect over a long period of time. The second step in the pre-cancerous period is that of inflammation. The author quotes Slye, "Cancer is a mode of growth probably allied to regenerative processes." Attention is drawn to the fact that the leucocytes, on breaking up at the point of inflammation, liberate an enzyme and possibly an activating agency that increases the rapidity of cell growth in the repair. Peroxidase has been identified in this situation, and is supposed to result from the breaking down of the bodies of the leucocytes.

A short dissertation is given on the enzymes and their nature, as well as their general mode of activity. They are substances of colloidal structure which have this in common, that they are able to accelerate chemical reactions. The term "enzyme" is thus included in the more general term "catalyst." In general the velocity of the reaction is proportional to the quantity of "catalyst." Endoenzymes are intracellular; exoenzymes, on the other hand, are eliminated from the cells from which they are formed and have their seats of action in the solutions outside the cells. Peroxidase is an example of the former, while pepsin in the gastric juice is an illustration of the latter group. The author's theory hinges on the activity of oxidizing enzymes. Acids and bases act specifically as activators of some enzymes and paralyzers of others.

The body tissues develop enzymes that are antagonistic, namely anti-enzymes, in order to hold in check any excess activity. Moderate heat acts as a stimulant of these bodies, whereas high degrees of heat destroy them. Light also acts in a similar way, as also does exposure to X-ray, so that there may be a double effect dependent on the dosage. Hydrocarbons of the paraffine group act as stimulants. He quotes Jolies and Oppenheim, "The catalase value for normal blood is 23. In carcinoma there is a greater decrease than in any other disease studied, the values of the blood falling from 1.3 to 2.1."

The author discusses the fact that lack of oxidation inhibits germination in seeds and cell division after fertilization of the egg. The rate of growth of both animal and vegetable life is influenced by factors such as oxydasis and X-ray, which act on enzymes. The author holds that the rate of cell-division is dependent on increased growth rate. He quotes Howard and Schultz, "Dynamic energy produced by cellular metabolism manifests itself in cellular growth and function."

In discussing the formative stimulus in cell growth, the author believes that the cause for this acceleration is "the catalytic action of local, concentrated oxidizing enzymes, particularly peroxidase, or an increase in their co-enzymes, or accelerators, in one or more previously normal cells; these cells take on a new independent energy production and growth rate as a result. The transmission of this newly acquired concentration, or accelerated action, of endoenzymes from parent cells to daughter cells, assures the progeny a permanent and independent increase in oxidations, energy production, growth rate, and division rate. This concentration may be brought about by the process of injury and inflammation, where the enzymes are liberated in abnormal amounts.

Attention is called to the prevalence of cancer in chimney sweeps and in those carrying burning charcoal braziers hooked to their belts, as an instance of the rôle that heat may play in the production of cancer. According to the author's theory the difference between the normal cell and the cancerous cell is essentially a difference in the speeds of their biochemical reactions. The normal coexisting exoenzyme activity in the body is regulated and held in check by anti-enzymes. A lack of these anti-enzymes in cells where oxidizing enzymes are in predominance, might lead to the lawless growth of cancer.

Various theories that have already been advanced for the causation of cancer are discussed, and harmonized with the author's enzyme theory. As it applies to benign tumors, the author's supposition is that it acts only in degree, rather than differently, so that the cell growth is neither as rapid nor lawless. His conclusions are (1) that cancer is the result of localized, unchecked, hyperoxidation in epithelial cells; (2) that this condition is brought about by concentrated, accelerated, and uninhibited action of intracellular oxidizing enzymes, as a result of various injurious agents. It is evident that here, as elsewhere in pathology, we are dealing not with independent problems, but with specific outlooks only on the wider field of the general field of biology.

H. S. STOKES

Reuren, F. T., Van, Jr.: The Anatomic Distribution of Cutaneous Neoplasms. *J. Am. M. Ass.*, 1916, LXVI, 141.

During a period of nine years histological diagnoses were made on 353 tumors of the skin. An examination of the anatomic distribution of the more

important groups shows that of 122 epitheliomata 75 per cent were located above the clavicle and 84 per cent on the uncovered surfaces of the body. Epitheliomata of the forehead, scalp, and cheek are evenly divided among the squamous and basal-cell variety, all those on the lip and nearly all those on the neck and hand were squamous, but 11 of 11 on the nose were basal-cell. Of papillomata nearly half, 45 per cent, were above the clavicles and 75 per cent were on the unclothed portions of the body. The angiosarcomata also preferred the same regions, 57 per cent being above the clavicle and 81 per cent on unclothed surfaces. On the other hand, fibromata, sarcomata, and melanosisarcomata show a distinct preference for the covered parts, occurring on the unclothed parts in 40, 33, and 11 per cent, respectively.

In short, of malignant tumors, the epitheliomata show a distinct preference for the head and neck, the sarcomata and melanosisarcomata for the trunk and extremities. The former favor unclothed, the latter covered parts of the body. The large majority of epiblastic tumors, irrespective of malignancy, occur on unclothed surfaces, while those of doubtful or frankly mesoblastic type occur chiefly on the clothed portions.

E. K. ARMSTRONG.

Gillette, W. J.: The Use of Steam in the Treatment of Superficial Cancer. *Med. Rev.* 1916, **10**, 545.

Following the lead of Byrne, Fredericks, and Perry who used heat to destroy cancer tissue, the author has used superheated steam with great success in the treatment of fungating cancer and sarcoma masses. In sixteen cases there has been recurrence in only four and in one of these re-steaming gives prospect of ultimate cure. While recurrences are still possible in the others, all are clinically well at the present time.

Under proper pressure steam may be made to penetrate to the depth of an inch or more, but not readily through fascia or thick fat. This difficulty may be overcome by puncturing with the scalpel, or removing entirely, any fascia over which it is to be applied. As steam follows the line of least resistance cancer tissue will usually be invaded while the surrounding tissue is left intact. Absence of pain is noticeable.

For the employment of steam Gillette uses metal shells enclosing tubes through which steam is forced at a boiler pressure of fifty or fifty-five pounds into the tissue. The shells act as a protection to the tissues it is not desired to treat. The steam is carried in through the handle by means of fiber tubing and out again after use by way of a small nipple at the upper end.

E. K. ARMSTRONG.

Holt, O. P., and Ratterman, H. T.: Multiple Metastatic Sarcomata of the Lungs: Report of a Case. *J. Am. Med. Ass.*, 1916, **17**, 171.

The patient, a widow, aged 54, was admitted to the hospital May 16, 1915. Her chief complaint was

pain in the left lower chest, through and through the lung at the scapular level. The family history was negative for tumors.

In the summer of 1912, the patient noticed a firm swelling which appeared over the upper part of the right tibia just below the knee. This lump gradually grew in size and in September, 1913, was opened to allow drainage. No pus was found. The incisions were allowed to heal and had almost closed when there was evidence of an active tissue proliferation with protrusion of the tumor substance at the site of the first opening. A diagnosis of sarcoma was made and on December 19, 1913, the leg was taken off above the knee. The pathologist reported the specimen to be oat-grain-cell sarcoma.

During the winter of 1914-1915, the patient began to feel pain under the left shoulder blade and under the left arm. She took one cold after another. She coughed considerably in spells, but expectorated very little and seldom. During one severe coughing spell she brought up an old blood-clot with some phlegm. She lost weight steadily and rapidly. There were no night sweats, and no gastric or bowel symptoms.

The chest findings were interesting. The respirations were somewhat rapid. The expansion was fairly good, but the excursions were more limited on the left side. The supraclavicular and infraclavicular fossae were deep and well marked, especially on the left side. There was dullness over both apices and dull areas scattered over both lungs. There was a large area of dullness in the left axilla extending anteriorly. The breath sounds were roughened and the breathing bronchovascular over the dull areas with medium moist and dry râles during and at the end of expiration.

A roentgenogram showed multiple rounded opaque areas scattered throughout both sides of the chest. These areas varied in size from that of a five cent piece to that of a silver dollar. They looked typically like malignant metastatic deposits, in all probability sarcoma.

The patient died June 30, 1915, without regaining consciousness. When the chest was opened at necropsy, the lungs did not collapse. The diaphragm reached to the fifth rib on the left and to the first interspace on the right. In the left pleural cavity there were recent fibrinous adhesions laterally and anteriorly above the level of the nipples; in the right there were similar adhesions over the posterior part of the upper lobes. All these adhesions were over nodular masses situated in the lungs beneath the pleura. Beneath the sternum in the right lung were several of these nodules with well-formed fibrous adhesions between them and the sternum.

Both lungs were filled with large and small nodular growths, which varied in size from a small pea, in one case, to a small orange, 8 cm. In the left lung most of the nodules were softened and, when trachea was put on the lung, they ruptured and the contents came forth looking somewhat like moist cottage cheese. In one instance a nodule was

situated in an infarct caused (apparently) by pressure of another mass on the vessels of the part. The smaller, better nourished growths were clear, pearly white in color, were rounded or oval, and had something of the appearance of soft fibromata; that is, they were indistinctly striated or lamellated and juicy. Older ones, which had not undergone distinct softening, were often darker in color, sometimes with lines of greenish or olive across the grayish surface of the growths. The pleura above all the sub-pleural nodules was inflamed. Microscopic examination of the tumor masses showed them to be spindle-cell fibrosarcomata of the short spindle-cell variety, with a marked tendency to perivascular arrangement.

EDWARD L. CORNELL.

Wood, F. C.: Action of "Autolysin" on Mouse Tumors. *J. Am. M. Ass.*, 1916, lxxvi, 94.

In order to determine whether "autolysin" had any action on tumors in mice, 21 mice bearing spontaneous tumors were injected with "autolysin" in doses varying from 3 to 125 minims. No tests were made on animals bearing transplanted tumors for the reason that frequently such growths disappear spontaneously after the tumor has reached a certain size. Test injections were made upon normal animals to determine the toxicity of the "autolysin," using the oral dosage suggested by Beebe and Horowitz. It was found that the drug was non-toxic even in large intravenous doses.

There was no evident change clinically in the treated animals. No gross changes were observed in the tumors that were not also seen in untreated controls. At the site of injection there was found necrosis with leucocytic infiltration. Tumor sections showed an active state of growth, particularly well marked in those longest under treatment.

The conclusion arrived at was that "autolysin," either in large or small doses, does not affect spontaneous malignant tumors in mice.

E. K. ARMSTRONG.

Rohdenburg, G. L.: Irritation as a Factor in Malignant Tumor Development. *N. Y. M. J.*, 1916, ciii, 201.

Rohdenburg cites four cases in which a simple form of irritation, harmless in the majority of patients, was apparently the cause of a malignant tumor.

In the first case, the pricking of a simple cyst of an ovary was followed in four weeks by an inoperable sarcoma of the same ovary. The second case was that of an adenocarcinoma of the perineum following a gonorrheal abscess of a Bartholinian gland. A recurring fibrous osteitis of the jaw after a splintering of the bone by a tooth extraction and a carcinoma following a corn constituted the remaining cases.

The author emphasizes the close relationship between regeneration, as seen in healing, and tumor development.

ALFRED H. NORTON.

Gruner, O. C.: A Study of Changes in the Leucocytes in Certain Cases of Malignant Disease. *Brit. J. Surg.*, 1916, iii, 306.

The author gives an original study of the leucocytes with relation to their form, amœboid movement, death form, etc., in cases of malignant diseases.

The author used smears stained by the Pappenheim method. His reasoning is that there is no primary specific disease of the blood itself, but that any changes occurring in the leucocytes are a result of the circulating metabolic changes or poisons in the blood stream.

He devotes especial attention to neutrophile leucocytes as regards the relation between juvenile and adult forms, relation of living to dead forms, presence of "bizarre" forms, presence of nuclear excrescences or pseudopods, evidence of active amœboid motion. In the lymphocytes he devotes attention to the ratio between juvenile and adult forms and the ratio of living to dead forms.

He found that a diet rich in purine bodies gave a blood picture closely simulating that seen in malignant disease, so he advises a purine free diet for several days before the blood examination is made. The blood findings of leucocytes depends on the actual composition of the serum, the degree of the vitality of the cells, and their individual idiosyncrasies.

A morphologic agent may stimulate the leucocytes to great activity, either reproductive or if it be phagocytic it will be shown in amœboid movement. It may further damage the leucocytes and cause the proportion of dead and dying leucocytes to increase.

Gruner draws the following conclusions:

1. If a smear shows neutrophilia and fat drops in any of the neutrophils, and if the nuclei of the neutrophils are largely multi-fid, the case is one of coccal infection of great or very great severity.
2. If the smear shows a relative absence of lymphocytes, if there is no leucocytosis, or if multi-fid nuclei preponderate, the case is almost certainly not one of malignancy.

If there is neutrophilia with bizarre forms or pseudopods in numbers, if the leucocytes in many instances show amœboid outlines, if the monocytes show amœboid nuclei the case is almost certainly one of malignant disease.

HARRY G. SLOAN.

Gamble, H. A.: Acute Emphysematous Gangrene. *Internat. J. Surg.*, 1916, xxviii, 404.

The author reviews 11 cases of acute emphysematous gangrene, 10 of which occurred during the summer months and one during the winter season. Two were crushing injuries of the lower extremities, 1 a contused wound of the lower extremity, 6 gunshot wounds, and 2 were compound fractures of the tibia. In none of these cases was the blood supply in any way compromised after the receipt of the injury.

The systemic symptoms were those of a most intense toxemia. Locally, there was a gangrenous

odor and a greenish black color on the surface of the wound, usually coincident with the development of crepitation in the surrounding tissues with edema and swelling.

The prognosis is always grave. In the 11 cases there were 5 deaths and 6 recoveries, a mortality of 45.5 per cent. Treatment is both prophylactic and curative. It is essential that early thorough sterilization combined with free incisions for the relief of tension and the promotion of free drainage be adopted. Where possible the author amputates as far away from the site of infection as possible. The stump is bathed freely in tincture of iodine; the flaps are left open; silk worm sutures are introduced but not tied.

C. G. Hays

Bishop, E. S.: Preliminary Considerations of Drug Addiction in Surgical Cases. *Am. J. Surg.*, 1915, vol. 435.

Bishop says it has been his experience that the average surgeon expresses little or no interest in the addiction of patients to a narcotic drug and regards it as a condition which does not concern him. This position, he holds, is reasonable if the surgeon accepts the responsibility for his work in the operating room only; otherwise anything which influences the recovery and well-being of his patients should command his attention and consideration.

He believes that the medical profession as a whole has regarded the mere fact of continued use of a narcotic drug as the element of paramount importance in narcotic drug addiction, and that too little attention has been given to the actions of the drug of addiction upon the person addicted and to the influences of the physical addiction mechanism in the healing and repair of other conditions. He points out that very many surgical cases have terminated unsatisfactorily, simply and solely because of the surgeon's failure to grasp the importance of, and his inability to understandingly deal with, addiction to a narcotic drug existing intercurrently in a surgical case. The surgeon is not to be blamed in this attitude toward the addict as in it he simply reflects the opinion of his medical brethren and the weight of their authority. The general medical consideration of the treatment and care of drug addiction has been too much concerned with the mere fact of continued use of the drug, and too much confined to efforts directed toward the mere withdrawing of the drug.

The reputation that a drug addict has as a poor surgical risk and a difficult case for surgical handling, and the frequent refusal of surgeons to operate upon addicts until they shall have stopped the use of their drug is unjustified by clinical fact. Disagreeable course and unsatisfactory issue in the surgical handling of a narcotic addict are to be laid at the door of insufficient medical appreciation of addiction disease mechanism and its functional and organic influences, and inadequate clinical ability to analyze, estimate, and control these elements. The addict is not a poor surgical risk because he is an

addict, and his lack of repair and slowness of recovery—in the experience of many surgeons—as a rule has not been due to the existence of his addiction. These things have been due to the surgeon's lack of appreciation of addiction disease mechanism and his inability to competently control it. Competently controlled addiction disease mechanism can often constitute a helpful post-operative influence rather than a hindrance. A very large number of addicts have been operated upon and have gone through a satisfactory recovery and convalescence without the attending doctors' realization of the existence of their addiction. The intelligent addict entering upon an operation or illness almost invariably makes provision for a sufficient supply of his drug and himself controls his addiction disease mechanism.

The mere fact that a patient is using a narcotic drug and that he uses, within reasonable limits, a larger or smaller amount of that drug is a matter of very minor importance as compared with his functional, nutritional, and metabolic efficiency. The satisfactory recovery of a narcotic addict from a surgical or medical condition for which he is being treated depends to a great extent upon his functional balance and his organic and metabolic adequacy, and these elements are largely under the control of and vary with the extent to which the patient is kept in adequate narcotic drug balance. Attempts at reduction of dose below the amount of actual physical need in a narcotic addict is without justification during the course of surgical or other medical treatment. The establishing and maintaining of competent narcotic drug balance is one of the most important elements to be considered in the handling of a narcotic addict undergoing operation. Attempts of surgeons to unreasonably reduce or withdraw narcotic drugs as a desirable incidental procedure in the course of treatment for other disease conditions is inexcusable. It is too harmful a procedure to meet anything but condemnation. The author believes that failure will almost invariably result from an attempt at remedying narcotic addiction and, what is far more important, the result of the surgical efforts may be seriously handicapped and the issue seriously jeopardized.

The author believes that the complete and successful withdrawal of a drug of addiction is a matter of comparatively easy and assured accomplishment in the hands of a man who has learned to recognize, appreciate, measure, and control the elements which constitute and complicate addiction. It is a matter of extreme difficulty and is rarely successful in the hands of a man who does not understand these elements, and who cannot with clinical comprehension and intelligent understanding of the mechanism of addiction conduct a case of narcotic drug disease. The final withdrawal of the drug is comparable to an operation of election, and the time of its execution is a matter of arrangement and of preceding preparation. It should never be undertaken with the expectation of satisfactory issue in

the course of treatment for any ailment which demands the expenditure of recuperative powers. Recuperative forces should be maintained and directed toward whatever is the need of paramount importance at any given time. In a surgical case the indication of paramount importance is recovery from the condition for which the patient applied to the surgeon. The proper control of narcotic addiction mechanism and of its influences upon the patient addicted is the important problem presented by narcotic addiction as met in the field of surgical work.

Reilly, T. F.: The Signs and Symptoms of Impending Death. *J. Am. M. Ass.*, 1916, lvi, 160.

The author discusses the symptoms and syndromes observed in cases where death impends.

Death usually occurs as a result of (1) heart failure, (2) respiratory failure, (3) asthenia, (4) vagus failure, or (5) shock, with the centers in the medulla the controlling factors rather than any organ. There are few single symptoms pathognomonic of death.

An irregular pulse for the first time in the disease or its disappearance from the wrist with the patient recumbent is alarming, except in cardiac disease or in sudden severe hemorrhage. In the latter, if there is much facilitation death invariably occurs.

Pulsus alterans appreciated by the finger, means death within a short time. This is most common in fractures of the skull.

In adults, a pulse under 80 means that death is at least twelve hours away. In the aged, however, the pulse is often slow until death. In children, with a pulse under 120, death is rare within six hours.

Except in pericarditis, a pulse mounting gradually to 160 presages death; but the approach of death can not be foretold by the pulse as reliably in children and aged as in adults.

Cases of auricular flutter are very deceptive; the pulse may be 150 or more with extreme prostration, and recovery often occurs.

Gallop rhythm, not associated with rheumatic carditis, is always fatal. Of like import is a persistent, firm pulse in coma accompanied by hemiplegia. In all infectious diseases a strong pulmonary valve sound indicates that immediate fatal termination is improbable.

A high blood-pressure of 230 falling suddenly below 100 without hemorrhage, means a fatal issue. Likewise, when it steadily falls in any adult to 40. In pneumonia, Gibson's rule is unreliable in children or the aged.

Cheyne-Stokes' respiration in the sick practically always heralds death except in uræmia or cardiorenal disease. Rapid breathing following this phenomenon indicates that death is at hand.

A marked disproportion between inspiration and expiration, especially if accompanied by rapid pulse, is a fatal sign; also cold respiration from the nose and mouth.

According to Shradly, a persistent up and down motion of the Adam's apple foreshadows a rapidly

fatal outcome. White frothy fluid from the nostrils announces the end.

Absence of pupillary reaction to light except in syphilis, brain diseases, optic atrophy, fainting, or hemorrhage immediately precedes death; a sluggish reaction is serious. In most diseases, the pupil dilates widely just before death.

A film over the eyes, or tight closing of the eyes, with a firm, rapid pulse is a sign of impending fatality. Likewise, a turning of the eyes outward.

In children a passive congestion of the conjunctival vessels means approaching death.

A temperature of 108° F., except in heat stroke, is fatal. Likewise a rising temperature on the second day after onset of hemiplegia.

Loss of sphincter control is always a grave sign, especially when coma is not present.

In peritonitis, a fatal indication is a bright yellow discoloration of the tongue; likewise, black vomit forty-eight hours after operation.

Hematogenous jaundice following fevers, snake bites, and aphthous stomatitis in wasting diseases, means approaching death. Also the presence of persistent uncontrollable hiccough.

The appearance of large amounts of indican in the blood or transudates is a fatal indication. Substus tendinum and carphologia, except in typhoid, are of grave import.

Fibrillary heart-tremor in electric shock is always fatal.

The presentiment of a fatal issue by the patient at the onset of a disease is a bad omen. When a uræmic patient becomes jolly and bright a serious condition usually supervenes.

The author concludes with a short discussion of some of the superstitions of the laity in regard to the signs of approaching death. He believes that a number of them are quite logical. P. M. CHASE.

BLOOD

Cropper, J. W., and Drew, A. H.: The Occurrence of Bodies Resembling "Seidelin Bodies" in Anæmic and Fœtal Blood; Their Probable Nature. *J. Trop. Med. & Hyg.*, 1916, xix, 20.

The authors report the occurrence of minute scarlet dots or granules with a bluish body resembling "Seidelin bodies," and indistinguishable from them, in the red cells of the blood of pernicious anæmia, of the human fœtus, of newborn kittens, and rarely in that of children suffering ordinary anæmia. They believed these bodies to be the products of the degeneration of the nuclei of erythroblasts.

The specimens were fixed and stained as recommended by Seidelin. Emphasis was placed upon the care necessary in the preparation and staining of the specimen, upon the avoidance of the slightest acidity in the water used, and upon the care necessary to avoid confusing stained broken down platelets, etc., with the bodies.

In the examination of the blood of 60 persons with-

out obvious anæmia no "Seidelin bodies" were found, and in the blood of six cases of ordinary anæmia, slight and severe, only eight definite bodies were found. The single case of pernicious anæmia examined showed them, and every specimen from the eight fetuses and the six kittens showed them.

The bodies were described as being of three kinds:

1. A minute, highly refractile, red staining granule without any blue staining portion.

2. Blue-staining bodies without any accompanying granules. These were either ring-shaped, linear, or irregular.

3. One or more red granules either enclosed by, continuous with, or external to a well-defined blue-staining portion which appeared most commonly in the form of a ring. The red and blue bodies were generally close together and were eccentrically placed in the cell. The bodies belonging to this group resembled those usually described as "Seidelin bodies."

The authors state that the finding of these bodies in fetal blood and in that of newborn kittens made it difficult to believe that they were parasitic in nature and associated with the virus of yellow fever. They suggest that their occurrence in the fetal blood and in that of severe anæmia in which nucleated red cells appear in the circulation directed attention to their possible connection with the process of new blood formation. Further evidence in support of this view was secured by the study of the blood of newborn kittens in which nucleated red corpuscles, showing stages of degeneration of the nucleus from the normal cell to the ring-shaped blue body, similar to the "protoplasma body" of Seidelin, were found.

The red-staining granules were thought to be centrosomes, which have been demonstrated by E. H. Ross in nucleated red corpuscles of severe cases of secondary anæmia.

The conclusions drawn were: (1) that the bloods of pernicious anæmia of the human fetus and of newborn kittens contain bodies which appear identical with "Seidelin bodies"; (2) that these bodies are apparently absent from the blood of the normal ordinarily anemic adults, but are rarely found in the blood of anemic children; (3) that the bodies are the results of the nuclear degeneration which takes place in the conversion of erythroblasts into the normal non-nucleated red blood-cells; (4) and that the red-staining granules are probably centrosomes.

JOHN W. TURNER.

Burmeister, W. H.: Resuscitation by Means of Preserved Living Erythrocytes in Experimental Illuminating Gas Asphyxia. *J. Am. M. Ass.*, 1916, LVII, 114.

The literature of the subject is briefly discussed and two series of animal experiments are reported.

The author favors Haldane's theory that the central nervous system changes are secondary to the blood changes, and that death is essentially one of asphyxiation. In 1894 Hoppe-Seyler first

noted the carbon monoxide hæmoglobin spectrum. Today the action of carbon monoxide in displacing the oxygen of the oxyhæmoglobin is fully established. The affinity of the former for hæmoglobin is 110 times as great as that of the latter. Air mixtures containing as little as 0.05 per cent carbon monoxide are definitely toxic.

Kuchne in 1864 was the first to successfully resuscitate animals by indirect transfusion of deoxygenated blood. In 1900 Darrah reported 13 successful resuscitations by direct transfusion in dogs, and Crile and Lenhart reported 70 to 80 per cent recoveries by this means after all other known methods had failed.

The author followed Hustin and Weil's work with the indirect transfusion of citrated blood, and Rous and Turner's work with Ringer's solution. He mixed equal proportions of citrated blood and Ringer's solution containing 2.5 per cent dextrose, centrifuged just before use thus removing the larger part of the white corpuscles. The mixture remained unchanged for several weeks.

Twenty rabbits were asphyxiated until cardiac impulse ceased. Twelve received transfusions of prepared blood, with immediate recovery, although three died later, two due to hæmorrhage into the peritoneal cavity. The author believes venesection just before transfusion would have prevented this.

In the experiments on dogs, the asphyxiation of each animal was prolonged for 60 minutes so as to thoroughly saturate the blood with carbon monoxide. Forty dogs were used. Immediately following, attempts at resuscitation were started by artificial respiration and the injection of 1:10,000 epinephrin directly into the heart. With these means, where the heart had not ceased beating more than three or four minutes it was possible to start contractions and slight respirations. Dogs only reacting thus were used for transfusion. Upon this occurring, 125 to 175 ccm. of the blood were injected and at the same time venesection done. Fifteen dogs lived under these circumstances, while five controls died. Four additional controls received only epinephrin and Ringer's solution. These all died. Of the fifteen dogs, twelve recovered with apparently no ill effects that could be due to the asphyxia.

The conclusions are as follows:

1. Erythrocytes of some animals can be preserved intact for a considerable time.

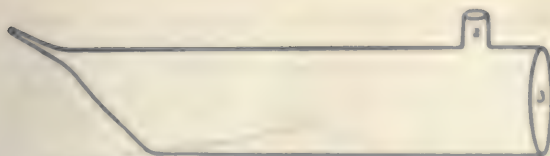
2. These can again assume their function in another animal of like species, and can prevent death from asphyxiation by carbon monoxide in about 75 per cent of all cases, provided cardiac contractions can still be elicited.

3. Emergency stations where these corpuscles could be obtained would prove invaluable in saving victims of gas asphyxiation.

P. M. CHASE.

Risley, E. H.: Simplified Methods of Transfusion. *Boston M. & S. J.*, 1916, CLXIV, 1.

The author has recently tried out the many advocated methods in the laboratory and makes the



1. Cannula end with ground glass tip.
2. For bulb and tube (situated on side instead of as here drawn).
3. For cork stopper.

following suggestions for those wishing to do transfusion and who wish to have on hand simple means of assuring its success.

Every physician who contemplates doing transfusion at all should provide himself with the following apparatus:

1. Two large (100 and 300 ccm.) glass cylinders, like cut, which are easily obtainable at any glass-blower's for the small outlay of about two dollars.
2. Five hundred ccm. in two bottles, of sterile 2 per cent sodium citrate solution. This can be re-sterilized by boiling repeatedly without deterioration.
3. A glass graduate (25 ccm.).
4. A set of glass syringes (two 5 ccm. and one or two 20 ccm.).
5. Two 16-gauge cannula-trochars.

With this equipment one will be able to do successfully any transfusion he may be called upon to do.

EDWARD L. CORNELL.

BLOOD AND LYMPH VESSELS

Johnsen: Treatment of Aneurism (Behandlung von Aneurysmen). *Berl. klin. Wochschr.*, 1916, liii, 72.

The author demonstrated at the Stettin Medical Society 16 cases of aneurism that he had operated on. The only treatment is operative. In pure arterial aneurisms there is always the danger of rupture until they have been operated upon, and even varicose aneurisms and aneurismal varices are to be treated surgically, for otherwise the continuous arterial pressure on its walls gradually increases the distention of the vein, while the nutrition of the peripheral parts suffers from the gradual withdrawal of more and more blood from the arterial system. He recommends suture of the vessel wall as the method of choice and thinks Matas' operation should be reserved for cases where suture is impossible. Continuous suture by Carrel's method is recommended, and the author also describes the technique of his method of suturing over glass rods. He does not advise cutting off the circulation with an elastic bandage, because it makes it more difficult to dissect out the vessels, and also because there is danger of injuring the vessel walls by the ligation, and this means more danger of thrombosis.

The best time for the operation is about the sixth week, and up to that time strong steady pressure should be applied to the aneurism. There is no

advantage to be gained by extensive pressure treatment, and it offers no hope of cure. It is inadvisable to operate sooner because of the imbibition of the tissues and the difficulty, resulting from it, of making out the anatomical relations.

In the discussion LICHTENAUER stated his belief that vessel suture is the ideal method, but that it is by no means always possible to use it. There is danger under some conditions of injuring the collaterals, and the collateral circulation is particularly important in these cases, because of the uncertain results of suture. He has had a number of very satisfactory results with Kikuzi's and Matas' methods of operation. He thinks it best, when possible, to cut off the circulation during operation. In aneurisms of the upper part of the thigh he uses the Momburg method.

BETHE said that he had performed circular suture in 6 out of 21 cases of aneurism, but had been able to establish a permanent peripheral pulse in only one. In spite of the most careful suture there is often secondary thrombosis. The vessel walls are not normal, but have undergone pathological changes and so the blood coagulates more readily. For this reason circular suture should be performed only when it is absolutely necessary in order to supply the peripheral parts with blood. In cases two to three months old the ligation of the vessels is not nearly so dangerous as in recent cases. The conditions are similar in arteriovenous aneurisms. In these cases the peripheral end of the artery is often nearly atrophied on account of the almost complete passage of the blood stream through the collaterals. Suture is unnecessary in small arteries and is directly contra-indicated in infected aneurisms which offer a poor prognosis at best. A Goss.

POISONS

Mouchet, A.: Chronic Recurrent Tetanus. *Med. Press. & Circ.*, 1916, d, 28.

Chronic recurrent tetanus is a rare disease but its recognition is very important in order to determine the correct treatment. The case reported was that of a soldier wounded in the supraspinous fossa by a shell fragment. The man developed tetanus and was treated with morphine and chloral in massive doses. He recovered but after several weeks the symptoms recurred. X-ray examination showed a fragment of shell beneath the scapula. Operation revealed the fragment and a piece of clothing. Recovery followed their removal.

The important points to learn from this case are three: (1) injection of antitetanic serum in every case with a wound; (2) free opening of the wound; (3) thorough extraction of all foreign bodies.

J. H. SKILES.

Oppenheimer, L. S.: Treatment of Tetanus. *Internat. J. Surg.*, 1916, xxviii, 409.

The author reviews the classical treatment of tetanus which today is practically limited to the

use of prophylaxis, magnesium sulphate, phenol, antitetanic serum, chlorotone, and chloral hydrate.

The principal factor in producing death is the rapid and terrible exhaustion due to the muscular contractions, and not the toxæmia, nor the neurotoxins; therefore the convulsions should be controlled and the patient's strength maintained while the toxæmia diminishes. By so doing many patients can be saved. Prompt prophylactic treatment, early administration of antitetanic serum, chlorotone, and chloral hydrate are all very valuable. The last mentioned should be given in large doses.

HENRY J. VAN DEN BERG

SURGICAL THERAPEUTICS

Fraser, J.: Value of Hypochlorous Acid in Treatment of Gas Gangrene. *Brit. M. J.*, 1915, II, 325.

The usual cause of gas gangrene is the bacillus aerogenes capendulatus along with the streptococcus. The usual location of the wound is in one of the lower extremities. The author has never seen a case of gas infection in a wound of the scalp or face, and only on one occasion has he seen gas infection in a wound of the trunk. The lower extremity is more frequently involved than the upper, especially below the knee.

The infection pre-eminently occurs in a puncture wound, and more especially in a wound which has been associated with extensive extravasation of blood into the tissues. From the wound opening a seamy, foul-smelling discharge appears; it is largely composed of broken down blood-clot; it is of a brownish color, and mixed with it there are bubbles of gas. The skin around the wound becomes of a faint purplish color. In the subcutaneous tissues there is an accumulation of lymphlike fluid. There is a similar infiltration throughout the intermuscular septa and connective-tissue planes. The muscular tissue rapidly loses its healthy red appearance; it becomes pallid and avascular, and disintegrates into a foul-smelling necrotic mass; it is always extensively infiltrated with gas; if the muscle is exposed to the air it becomes dry, brown, and leather-like.

The general aspects are the phenomena of fever; rapid pulse, increased respiration, restlessness, sweating, delirium, unconsciousness, and death. Ultimate death would appear to depend upon the structural changes which are found in the brain, the suprarenals, and the liver.

The method of treatment used by the author is the application of a 0.5 per cent solution of hypochlorous acid (known as ensol), occasionally intermitted with one or two other procedures, the application of the powder known as enpad (bleaching powder and boric acid) and the use of baths of hypertonic salt solution. The method of preparing ensol is as follows: 27 grams of dry bleaching powder is added to one liter of water, the mixture shaken, and 27 grams of boric acid then added, the whole is then thoroughly shaken, allowed to stand a few

hours, and then filtered through cotton wool. The clear solution is ensol. It is slightly alkaline to litmus and contains approximately 0.5 per cent hypochlorous acid. Enpad was made by finely grinding the dry bleaching powder and adding an equal quantity of boric acid powder.

Whenever a case of gas gangrene was recognized as such the usual treatment was immediately begun. The local wound from which the infection had apparently commenced was opened up thoroughly, and as far as possible all free blood-clot was removed. Whenever an emphysematous sensation could be detected an incision about two inches long was made. Each wound was then thoroughly irrigated with ensol, and if the wound was of any depth irrigation was carried out under considerable pressure by means of a Higginson syringe.

Grossly infected muscle or skin was cut away. Gauze soaked in ensol was lightly packed into all the crevices. Drainage tubes with lateral openings for injecting ensol were used in large wounds. Dressings moistened with ensol were placed over the wound and were changed at from four to six-hour intervals.

After three to four days' treatment the wound was usually free from foul odor. Sloughing soon occurred and healthy granulation formed in the wound. Enpad was used as a dusting powder in addition to the above treatment, beginning the fourth day. On the seventh and subsequent days, until granulation was complete, the treatment was further modified by immersing the part for four hours each day in a bath of hypertonic salt solution.

Observations of the wound from day to day showed some interesting features. During the first twenty-four hours the foul smell of the wound entirely disappeared; the discharge as such entirely disappeared and was replaced by a lymphlike secretion. After the third day this lymphlike discharge tended to cease and granulation tissue began to form. Sloughs separated with extraordinary rapidity and the healthy granulation tissue which remained completed the process of healing.

Details of a very interesting series of cases are added.

J. H. SMITH.

SURGICAL ANATOMY

Mayo, C. H.: Errors in Anatomical Development; Their Cause and Surgical Significance. *Surg. Gynec. & Obst.*, 1916, XXII, 11.

The change of the invertebrate to the vertebrate not only concerns the nervous system but is just as important in the intestinal system and in the organs of nutrition and elimination. Anomalies of these structures which represent the superiority of the vertebrate are fraught with the most serious consequences.

All progress has been identified by such changes in the predominant species of any period which has enabled them to live in a different medium and to be sustained by different nutrition.

In a consideration of the causes of errors of development it is useless to study the changes in vertebrates alone, as during one-third of the period of gestation the vertebrates are almost alike in their development. Consequently such a study forces the student back to a consideration of invertebrate life.

In the higher invertebrates, such as the limulus, the peculiarity of development was a single straight gut connected with a cephalic stomach. The peculiarity of the nervous system, however, was such that it grew over the cephalic stomach exactly to conform with the growth of the nervous system over the ventricles of the vertebrate brain. Between the collections of nerve-tissue on the cephalic stomach are placed masses of digestive glands which resemble the cells of the liver and pancreas.

The invertebrate has a nervous system in front of the intestine, while the vertebrate is characterized by having the intestinal system in front of the nervous system.

If one considers the structure of the nervous system and its ventricles, the central or neural canal and its terminus in the first period of gestation, he will find that it is almost exactly like the cephalic stomach and straight gut of the invertebrate.

The gullet of the invertebrate disappeared within the skull, taking with it the pituitary gland, the area thus vacated being marked in embryonic life by a pharyngeal depression called "Rathka's pouch."

The pituitary did not develop from the infundibulum as it exists in the same position on the esophagus of the invertebrate. In the region of the infundibulum and of the hypophysis, because of developmental change or reversion, theoretically should be found the same types of tumors, that is, dermoids, cysts, and teratomata, as are found at the caudal extremity of the neural canal which has also lost its opening.

By such change the cephalic stomach and straight gut disappeared to become the ventricles of the brain and neural canal, which necessitated the ventral development of an intestinal system and the upward and backward growth of the segmented nervous system surrounding the spinal canal.

The cerebrospinal fluid is formed as a secretion of the choroid plexus and is found filling the ventricles and neural canal in the third month of the human embryo, which shows the period of the closure of these spaces.

An increase in the tension of the cerebrospinal fluid may be caused by loss of equilibrium between production and absorption of fluid as in hydrocephalus spina bifida. Maldevelopment may arise from changes in the mineral salts and from anything which interferes with the germ, the egg, or its development. Along these lines are explained cranial and spinal defects and club-feet, dermoids and teratomata, bladder and rectal anomalies from cloacal forms.

RADIOLOGY

Hvitz and Callot: Radioscopic Localization by Means of a Screen Perforated with a Lead Thread (*Localisation radioscopique par la méthode de "l'écran percé avec fil à plomb"*). *J. de radiol.*, 1915, p. 799.

The authors give the details of a modification of the fluorescent screen for which they claim greater accuracy than is usually obtained in the localization of foreign bodies. This is accomplished principally by a small orifice made in the screen through which a lead thread passes, kept to the vertical by a plumb weight. By manipulation of movement of the screen the exact depth of the foreign body position can be ascertained. The authors claim that in their apparatus several direct measurements, which must be taken in other apparatus and which are liable to lead to error, may be omitted, viz., the distance of the anticathode from the screen; the displacement of the ampulla with or without angle of deviation; the distance of the two radioscopic images of the foreign body; the distance of the screen from the skin. Dispensing with this unnecessary procedure renders their method more rapid. Under good conditions they claim that the variation in the actual position of the foreign body from its calculated position is not greater than a few millimeters.

A. Goss.

Aubourg and Barrett: One Year's Work of Two Radiologic Wagons (*Une année de fonctionnement des deux camions radiologiques de laarmée*). *J. de radiol.*, 1916, p. 699.

The communication made by these authors will be of particular interest to army surgeons or to those engaged in the organization of the medical and surgical service of armies or units for field service. Although the Balkan and Russo-Japanese wars furnish some data of interest, yet now for the first time has the radiologic equipment and details of operation in connection with actual war conditions been worked out on a systematic basis. The authors give a very detailed account of two of the movable units fitted for service at the front. Particulars are described under the headings: (1) radiologic equipment of automobile wagons, inclusive of personnel; (2) the use of the equipment in the field with the regulated methods of procedure. This systematic organization has resulted from the practical conditions forced by the war, which could not be determined beforehand.

A. Goss.

MILITARY SURGERY

Lévy, L., and Plisson, L.: Infectious Complications of War Injuries (*Considérations sur quelques complications infectieuses des blessures de guerre*). *Lyon méd.*, 1915, xii, 602.

The authors discuss tetanus and gas infection, and from the incidence of these two infections at the beginning of the war compared with that at present they conclude that, though the prognosis after they

have once developed is very grave, they are both preventable conditions. Tetanus has been practically controlled by the systematic use of antitoxin, and gas infection very materially diminished by early and complete surgical treatment of all wounds, exposure of all recesses to the air, and thorough irrigation of the exposed surfaces with hydrogen peroxide and ether. This treatment must be given early to be effective so that the question of preventing gas gangrene becomes really one of providing the most comfortable and rapid means of transportation for the wounded to a point where they can be operated upon in safety.

The authors believe that several varieties of bacteria may cause gas infection, and that the bacillus perfringens is responsible for many cases. They think it possible that in the future the surgical treatment may be supplemented by an antiperfringens vaccine and they are working on such a vaccine. In addition to the antitoxin in tetanus, they suggest the use of nucleinate of soda to increase the leucocytosis and thus the defensive power of the body.

A. Goss.

Kaiser, F. J.: Neuralgia After Gunshot Injuries (Ueber Neuralgien nach Schussverletzungen). *Beitr. z. klin. Chir.*, 1915, xxviii, 259.

Kaiser gives the histories of 6 cases of neuralgia after gunshot injuries of the limbs. Four of the cases were in the median and two in the sciatic. In all of the cases except one there was a mixture of neuralgia and neuritis. One was a pure neuralgia. The neuralgia generally begins a few days after the injury and proceeds slowly without any thickening of the nerve and without any trophic disturbances of the skin. The neuritis begins immediately after the injury and disappears sooner than the neuralgia. The inflammation is generally only perineuritic and does not cause interruption and destruction of conducting nerve fibers.

The treatment is tedious and consists of hot air, hot baths, massage, and electricity. Good results were obtained from the injection of one per cent novocaine and adrenalin followed by massage; injection of fibrolysin into the scar was also of value. When these methods were not effective (2 cases) the nerve was laid bare, freed from cicatricial tissue, and sheathed in a flap of muscle. Stoffel has recently published an article showing the positions of the limbs in which the nerves are under tension and in which they are relaxed. In these cases the limbs were held in the characteristic positions for relaxation of the nerves.

A. Goss.

Sackur: Gas Phlegmons in War Injuries (Die Gasphlegmone bei Kriegsverwundeten). *Med. Klin.*, Berl., 1915, xi, 1222, 1946.

The author gives a good review of the pathology of gas phlegmon, and also describes some of his own experiences with it in the past few months, as a surgeon in one of the large hospitals of the western front, where he has had many cases of gas phlegmon.

With reference to the etiology it is worthy of note that there is a great increase in the incidence of gas phlegmon in rainy seasons, because the wounds get more soiled by the wet earth. The lower extremities are much more frequently involved, because of course the clothing that covers them is much more soiled with mud than the clothing of the rest of the body. Gas phlegmon is very exceptional about the face and head.

Further study is necessary in order to determine the connection between gas phlegmon and thrombosis of the blood-vessels, but at any rate interference with the circulation predisposes to outbreaks of this wound infection. The diagnosis is not difficult in typical cases; in doubtful cases roentgenograms furnish a reliable method of diagnosis. The marked extension of the local process toward the distal part of the limb is probably explained by the fact that the interference with the circulation is greater in the part of the limb on the peripheral side of the wound than in the central part of it. The region of the body in which the phlegmon is found plays quite a part in the prognosis. Sackur lost the majority of cases where the buttocks were involved.

The treatment is free incision and if necessary amputation. Sackur does not believe that Bier's hyperemia is justified in the treatment of gas phlegmon of the extremities, because it is not free from danger.

A. Goss.

Fauntleroy, A. M.: Gas Bacillus Infection. *Ann. Surg.*, Phila., 1916, lxxi, 1.

The author gives a summary of knowledge gained during the present war relative to gas bacillus infection.

As a result of careful bacteriological studies laboratory men have identified the bacillus perfringens as a strain of the Welch organism and men of large experience are practically unanimous in pronouncing them identical.

The organism flourishes in the soil and is found in all localities where the present trench warfare is being conducted. The organism thrives best in the presence of necrotic material.

A fatal case of gas infection passes through successive stages; i.e., injury, infection, localized tissue necrosis, progressive gas production, circulatory disturbance, increased virulence, and septicaemia. By timely treatment the process may be arrested and eventually cured.

The pathology includes: (1) extensive destruction of tissue adjacent to the wound; (2) marked parenchymatous degeneration of muscles above and below the wound; (3) the toxins seem to have a selective affinity for fascial planes, producing greater destruction of them than of the adjacent muscles; the outer walls of the blood-vessels are acted upon by the toxins, thus we have the extravasation of blood seen beneath the skin.

The characteristics of the wound in gas bacillus infection are as follows:

After two to five days there is a swelling and gas forms in the tissues; there is an induration of the skin; there is a slowly, progressive brownish discoloration of the skin and adjacent tissue; a fetid odor is characteristic of the serosanguinous discharge from the wound; and there is a more or less sudden appearance of vesicles, which vary in size from a pea to those several inches in diameter. Although a pulse may be felt in one of the arteries distal to the wound during the early stages of the infection it becomes progressively weaker and in the last stage it is always absent.

The fluid in the vesicles rarely contains the organism. In all fatal cases the heart, large blood-vessels, and the brain contain large numbers of gas bubbles.

Injuries of sufficient severity to predispose to gas infection are usually associated with more or less shock, evidences of sapremia, and in from ten to thirty hours after the injury manifestations of the specific invasion are apparent; there is a rise of temperature of 1 or 2°, rise of pulse-rate, headache, malaise, anorexia, and thirst. This is succeeded by the second stage: namely, progressive gas formation, circulatory disturbances, and increased virulence. The pulse-rate increases out of proportion to the rise in temperature. The temperature may reach 104 or 105° F. The discharge from the wound increases, the part swells, crackling in the tissues is very marked, there is mottling of the skin, the constitutional symptoms increase in virulence until the patient passes into a fitful coma-like condition which heralds the final grade which is septicemia. In this stage there is a falling of the temperature curve and a rising pulse-rate.

The prognosis is dependent on the location of the wound, wounds of the extremity being more often the source of this infection; the amount of pulpified tissue; the length of time elapsing between the injury and the institution of proper surgical measures.

The treatment is divided into prophylactic, abortive, and curative.

Under the first head are included proper training in personal hygiene; the proper construction of trenches, with a view of diminishing the possibility of soil contamination; and proper first-aid treatment, which should consist in the liberal use of iodine.

Abortive treatment should be begun within 12 hours.

Mechanical measures consist in the removal of foreign bodies and ragged tissues, and the continuous application of antiseptic agents which will kill organisms as well as cause a detachment of devitalized tissues. Dakin's fluid is such an agent. Subcutaneous injection of oxygen has been tried and found to have little or no influence on the infection.

The indications for amputation are largely a matter of surgical judgment and experience.

ISIDORE COHN.

Holcomb, R. C.: *First-Aid in the Navy*. Maryland M. J., 1916, lix, 8.

Distinction is made between emergency surgery administered by a trained physician, and first aid administered only as a temporary expedient by unprofessional or untrained persons.

In the large naval yards and manufacturing plants one or more medical officers are in constant attendance, and the first-aid package is not needed.

In war time the army is a mobile organization and the situation is entirely different. The delay in getting the patient to the surgeon and the environment inviting infection makes the opportunity for practicing aseptic surgery rare. The surgery of trench warfare is of much interest to the naval surgeon, as more than one-tenth of our medical corps is in the field service today.

Holcomb calls attention to the necessity of having different first-aid packages for different branches of the service. Those for use where injury is apt to be from small arms differ from those to be used where wounds occur from shells, or from flying fragments of steel as on shipboard, or from injuries apt to be sustained by aviators, where burns and fractures are common.

The packet issued to landing parties is small, covered by an impervious container; it consists of two compresses, each sewed to a bandage so they will not drop off in handling, one for the wound of entrance the other for the wound of exit.

Instructions in emergency first-aid treatment are given to every man and officer in the navy. This course of instruction is uniform and consists of five periods, in which are covered the demonstrating and applying the contents of the first-aid packet, shell wound dressing, treatment of broken bones, and extemporaneous methods of immobilization, treatment of wounds in general. The instructions cover not only what may be done, but in certain wounds, as of the chest and abdomen, some of the things that should not be done; also methods for controlling haemorrhages and the resuscitation of the apparently drowned. Certain selected groups are further instructed as to transportation of the wounded to the dressing stations.

D. L. DESPARD.

Frank, J.: *The Fate of Our Wounded in the Next War*. Chicago M. Recorder, 1915, xxxviii, 20.

Frank, Surgeon-General of the state of Illinois, and a member of the Medical Reserve Corps of the Army, accompanied Field Hospital Co. No. 1 and Ambulance Co. No. 1, U. S. A., on a march from Fort D. A. Russell, Wyoming, to North Platte, Nebraska, a distance of 242 miles covered in 24 marching days, and thence by rail to the sanitary instruction camp at Sparta, Wisconsin, where he remained a few days to complete his observations.

The report of the trip affords an insight into the history, organization, equipment, and training of mobile sanitary units for field service. The reader is further familiarized with life on the march, in camp, with cantonment hospitals, and the utiliza-

tion of such material as the service affords to make the existence of surgeons, attendants, and patients possible in a campaign.

Frank pays high tribute to the skill of the medical officers of the army as sanitarians, as organizers, as disciplinarians, as tacticians, and as physicians and surgeons, and proposes the question, "What will become of our wounded in our next war, considering that many volunteers will have to be depended on for a future campaign?" He points out the present deficiency of sanitary units in the National Guard and the limited training accorded them in times of peace. Professional skill alone will not be sufficient to enable surgeons to lead such units as field hospitals and ambulance companies to useful activity in the event of war. He points out the need of prolonged training in the field under warlike conditions and proposes that the present annual state guard encampments, lasting about a week, be abolished and long marches with repeated field exercises be adopted in their stead. Even with the limited funds now available money is not the sole question, since with the avoidance of railroad transportation fixed camps will be saved. Only such training will fit medical officers of the National Guard for handling the wounded under their care in an effective manner both for the benefit of the sufferers and the army as well.

In an appendix entitled "Technical Notes" Frank contributes valuable data on the Medical Reserve Corps, as to the disposal of waste in camp, certain appliances for the transportation of wounded, inexpensive improvised "fireless cookers" to provide hot food and drinks for patients and exhausted soldiers at a moment's notice. He also discusses the proposed new field belts, the pockets of which contain certain medicines, drugs, and instruments with which first aid can be administered and lives saved on the battlefield. The old method of having an orderly carry a large bag or pouch slung over the shoulder is condemned as unreliable and clumsy.

Zuckerkindl, O.: Treatment of Wounds in War (*Unter Wundbehandlung im Kriege*). *Deutsche med. Wochenschr.*, 1915, xli, 1505.

Before the war the general agreement was that wounds should simply be covered with an aseptic dressing and treated as conservatively as possible. This view was largely due to the bad results of active wound treatment in the pre-antiseptic era. Riesel says that he believes too much operating was done in 1870-71 and too little in 1914-15.

If the aseptic dressing is as important as it is generally held to be the wounds should not be infected or at least only slightly infected. Unfortunately this is not true. The great majority of them are primarily infected, so a more active treatment than simple aseptic dressing becomes necessary. Yet it is quite true that the substitution of antiseptic for aseptic dressings has not had much effect. The reason for this is that antiseptics must be applied almost immediately after the wound is

made if they are to be effective, moreover as applied on the field they do not reach all the recesses of the wound. The most rational treatment therefore seems to be to apply an aseptic first dressing and get the wounded into the hands of a surgeon as quickly as possible; then the wounds should be opened up, incised freely, and drained. Mechanical disinfection seems to be much more effective than chemical. Of course the earlier this surgical treatment is given the better its results.

Early operative treatment is especially necessary in wounds of the skull and joints, and a number of illustrative cases are described. A. Goss.

Gray, H. M. W.: General Treatment of Infected Gunshot Wounds. *Brit. M. J.*, 1916, i, 1.

The author states that since the early part of the war it has been generally acknowledged that antiseptics have proven ineffectual, both as preventive or disinfecting agents in badly infected, lacerated wounds. He says that regardless of the type of antiseptic used, most wounds ran a fairly definite course, the length of which depended mainly upon the patient's resistance, and that these resisting agencies of the patient's own body are more effective in dealing with the local infection than any antiseptic solution, powder, or paste.

He states that it has been proven to the satisfaction of the surgeons working in his particular area, that the use of salt solutions is of far greater importance than antiseptics, and that the addition of antiseptics to the salt solution has not yet proved of any advantage, with the exception that in some instances they act as effectual deodorants.

He cites the following general considerations governing the use of salt solutions:

1. The solution must be brought into contact with every infected part of the wound.
2. Hypertonic solutions stimulate a more or less profuse flow of lymph containing antibodies, and thus bring about what has been called "lymph lavage" of the tissues lining the wound.
3. Isotonic or physiological salt solution stimulates diapedesis, that is to say, it brings about a concentration of leucocytes in these tissues. These phagocytes are in large measure shed into the wound cavity and form pus corpuscles.
4. The micro-organisms causing the infection make their way into the tissues lining the wound in a few hours. The rapidity and depth of penetration vary according to the kind of organism, the amount of devitalization of the tissues, and the method of treatment.
5. The infective material is carried by the missile into the depths of the wound; any superficial treatment is therefore of no practical benefit, except in preventing fresh infection.
6. The presence of effused fluids, whether blood or lymph, of foreign bodies, and of badly lacerated or necrotic tissues, favors the rapid growth of organisms in the wound and hinders their expulsion from it.

7. Wounds deteriorate in condition, and inflammation may become rampant, especially during transport if the wounded part be not properly fixed and supported, even though no fracture be present.

8. A patient whose vitality is very low, owing to the severity both of the wound and of the sepsis, is unlikely to fight serious infection successfully and to survive a conservative operation and the strain which after-treatment involves. The question of amputation must therefore occupy a far more prominent place in the mind of the surgeon than it does in civil practice.

9. The method of treatment must therefore vary according to the nature of the chief infecting organisms, the physical character of the wound, the general condition of the patient, and according to whether or not he is to be transported within a short time.

He speaks of the great importance of free incision of infected wounds and emphasizes the significance of the thorough cleansing of the wound and the advantage of fixation of the wounded parts.

As regards drainage, he states that if the dead space is not large and can be obliterated by suitable bandaging, if the effusion is likely to be small in amount, and if the wounded part has been rendered aseptic there is really no necessity for drainage; and in cases where drains are used they should be put down to, but not into, the wound. The most interesting observation is in reference to the use of what is called the "tablet and gauze" pack. This consists of gauze packed fairly firmly into the wound, numerous tablets of salt being placed between the folds of the gauze. The gauze should be packed in concertina-wise, a tablet being placed between every third or fourth fold. A fairly large, fenestrated rubber tube is placed so as to reach to the deepest part of the main cavity, which is then filled with gauze and tablets. The dressing is made flush with the skin and the tube projects slightly from its midst. The surrounding skin is painted with a solution of iodine or other antiseptic application. Two or three layers of gauze are then used to cover the wound and surrounding skin. A suitable amount of absorbent cotton-wool is applied and a bandage wound on smoothly and firmly.

The superficial dressings are the only ones that are changed frequently, and they only when they become soaked with discharge. He says this tablet and gauze pack may be left in for many days, in some instances it has not been removed for fourteen days. After the first twenty-four hours or so, it often keeps remarkably dry. Usually in six to eight days the pack is removed, preferably under an anæsthetic.

The use of saline hypertonic salt solutions is supported by a summary of replies which the author received from questions sent to 22 hospitals. It was the unanimous opinion that treatment of wounds by hypertonic saline solution was more satisfactory than any other method used.

At the time the letters were sent out, baths were apparently preferred, a warm 5 per cent solution of ordinary table salt being used. Continuous irrigation was mostly used after flapless amputations. Hot fomentations of 5 to 10 per cent saline were strongly recommended. For the deep wounds the tablet and gauze packs were judged to be the best.

D. C. BALFOUR.

Sehrt, E.: *Passive Hyperæmia in the Treatment of Severe Grenade and Shrapnel Injuries* (*Die Stauungsbehandlung schwerer Granat- und Schrapnellverletzungen*). *München med. Wchnsch.*, 1915, xlii, 1260.

Sehrt describes his treatment of 73 cases of severe injury by means of passive hyperæmia. Rubber bandages were put on far enough beyond the wound so that there was a zone of healthy tissue between the wound and the bandage. They were left on 6 or 7, or even in some cases 12, days. They were put on without any previous treatment of the wounds, which were simply covered with sterile gauze loosely bandaged on. The dressings were not changed till the time to remove the bandages, even though in some cases flies or maggots had entered the wounds. The high fever which was present in the grenade injuries fell gradually to normal, the pain stopped soon after the application of the bandages, and a great quantity of secretion was discharged from the wound; the tissues around the wound showed no œdema when the bandages were removed.

Sehrt believes that this passive hyperæmia prevents the general involvement of the organism in the infection more effectually than any other method of treatment. It seems especially valuable immediately after the injury until the organism has gained time to wall off the infection with granulation tissue. The results of the treatment were particularly striking in gunshot injuries of the large joints, even when suppurative inflammation had already begun, and its value was shown especially in the maintenance of function and the avoidance of ankylosis. It also seems to limit severe gas phlegmons, and to put a stop to the extension of the process.

A. Goss.

Winn, D. F.: *Statistical Report of Cases Treated in the American Red Cross Hospital, Kiev, Russia*. *Mil. Surgeon*, 1916, lxxviii, 56.

Winn reports his work during eight months at Kiev. Tetanus and gas infection were very prevalent, especially after the snow melted, when soil contamination was at its maximum. The Russian army uses no prophylactic serum, for two reasons: (1) difficulty in getting the serum from the only open market—America; (2) lack of appreciation of its value.

The following excerpt from the author's report is very illuminating as to the inefficiency of the Russian Medical Department: "On account of the close-range fighting, mutilating wounds were the rule.

we saw few of the so-called "humane bullet" wounds. Most of the fractures of the arm and leg were literally bathed in pus at the time they reached us. At the first dressing at the front, plaster or starch casts were applied and the cast marked with the date of application and whether clean or infected. Frequently there was no mark to show the locality of the wounds. No windows were cut. Therefore, many of these men went from four to eight days without a dressing, since that was the average time required to transport them to Kiev. The result was that the original dressing coked up the wound, the pus burrowed about among the muscles, and the patient got an extensive cellulitis and the full benefit of the accumulating toxins."

Another interesting comment Winn makes is that bullet wounds were more numerous than wounds caused by shrapnel, shell casing, etc., thus showing that the character of warfare on the eastern front differs materially from that on the western.

W. M. BOOTHBY.

MEDICOLEGAL

Kennedy, J. W.: *Our Legal Handicap*. *Med. Council*, 1916, 221, 57.

The author expresses his belief that if members of the profession were afforded sufficient protection and were permitted to exercise their medical and surgical privileges, the mortality would be less than one-third of 1 per cent in abdominal surgery, while the mortality in abdominal surgery throughout the country now ranges from 2 to 10 per cent. This disparity is due to human errors, and the state legislatures are largely responsible.

The slothful practitioner who causes an occasional death should be handled by the profession and brought into more progressive thinking. Kennedy

most bitterly resents the present state laws which legalize and countenance the most perverted and inconsistent ruling when it comes to making laws which deal with health. He resents the fact that a legislative body endorses those means which prevent the execution of professional rights and the use of knowledge which is definitely life-saving. He contends that the law has no right to exact a standard of one class of men and then place in competition with them individuals who have not qualified as practitioners of medicine and who are the means of keeping the patient from proper treatment until too late.

He maintains that if a professional monopoly could be obtained by men of the highest ideals and standards of scientific attainments then there would be a monopoly with a soul which would be truly life-saving to the extent of scientific qualification and attainment becoming to the era in which we live.

He resents the present state of affairs most of all because a lamentable number of the profession have sacrificed their lives to advance the calling only to have the work thwarted by a body of mislabeled men which prevents us from the maintenance of the magnificent heritage which those distinguished deceased gave us. In conclusion the author states: "It may not be a comfort to the weary practitioner or the fatigued specialist to know that we are only an unimportant rear guard to those mighty men who are at the front and are the true heretics in the progress of our profession, but it is to these leaders our professional hat must be ever raised. Therefore, to sum up the first great cause of death-rate, as I have seen it, is that 45 per cent of our deaths are due to human non-professional errors which come from an unjust legislature which demands ideals and in the next act takes from us the opportunity to attain those ideals."

EDWARD L. CORNELL.

GYNECOLOGY

UTERUS

Balfour, D. C.: The Relative Merits of Operations for Cancer of the Uterus. *Surg., Gynec. & Obst.*, 1916, xiii, 74.

The author's observations are summarized as follows:

The best operation for cancer of the uterus is the one which permits the widest extirpation of the disease commensurate with the lowest possible operative mortality, and the minimization of immediate and late complications. Unfortunately, no one operation has proved so satisfactory, either in primary or ultimate results, as to leave the treatment of cancer of the uterus on a settled basis. Certain peculiar features of cancer of the uterus and of the cervix particularly, in relation to symptomatology, variability in malignancy, and the rôle played by infection render important the intelligent utilization of every known means to combat the disease.

It is well known that with cancer in any part of the body secondary infection is an important factor in the spread of the disease, and consequently in the immediate and end-results of the operation. Malignant disease of the cervix is a good example of this septic type of cancer, statistics showing that in 40 per cent of individuals dying from cervical cancer no evidence of metastasis is found.

Much of the pessimism in regard to the earlier history of operations for cancer of the cervix was due to the fact that the disease was often disseminated as a direct result of traumatism at operation, not only through the vascular system and the lymphatics but by transplantation to the operative wound. Autogenous grafting as the result of mechanical injury is an important cause of recurrence and is frequently observed in cancer in various situations.

The cancer when situated in the cervix is first destroyed by the cautery and then a dissection made with the Paquelin cautery knife through the vagina and perimetrial tissues, the separation of the bladder by gauze dissection being the only part of the operation which is not done with the cautery. If the fundus of the uterus is drawn out anteriorly before clamps are placed and the clamps applied from above down, injuries to the bladder and ureter do not occur. After removing the uterus in this manner, the tissues in the bite of the clamps and the clamps themselves are thoroughly heated. The clamps are left on forty-eight hours and unlocked at least ten hours before removal. The iodoform gauze which has been packed lightly into the space between the clamps is left undisturbed for six or

seven days. This operation has given as good results under similar conditions as have been obtained from total abdominal hysterectomy, and with a lower operative mortality. It is especially applicable to elderly and obese patients who are poor surgical risks.

The author became interested in the Percy method about two years ago and from experience in more than one hundred cases is convinced of its great value. Its essential and advantageous features are: (1) the slow heating process; (2) the abdomen always open; (3) the gloved hand of an assistant in the abdomen indicating the effectiveness of the heating process; and (4) the water-cooled speculum. The method undoubtedly offers more to the patient with advanced cancer of the cervix than any treatment with which we are familiar. Its value is so definite in the advanced stages that serious consideration must be given its possibilities in the earlier stages of the disease. Recently, in several cases of advanced cancer of the cervix, the author has accompanied the Percy treatment by ligation of both internal iliacs.

The ultimate benefits of this interesting procedure cannot yet be foretold. Attention should be drawn to the fact that in stretching the vaginal tissues in order to use large specula secondary carcinomatous nodules may develop in the vagina and about the vulva.

The conclusions reached are as follows:

1. Patients with cancer of the cervix not too far advanced and who are good surgical risks should be treated by thorough cautery sterilization of the local disease in the cervix and total abdominal hysterectomy of the Wertheim type.

2. When cancer is confined to the cervix, the vaginal outlet fairly lax, and the patient a poor surgical risk, i.e., obese, with cardiorenal disease, etc., the preferred treatment is the clamp and cautery vaginal hysterectomy.

3. In the more advanced stages of the disease if the patient is a good surgical risk the two-stage operation should be done; i.e., the Percy method of tissue coagulation by heat followed after some weeks by total abdominal hysterectomy. If the patient is a poor surgical risk the Percy method should be applied but the abdominal hysterectomy should be considered in the individual case on its merits.

4. In most instances in cancer of the body of the uterus a total abdominal hysterectomy should be done. In the small minority of patients with cancer of the body of the uterus and who are poor surgical risks clamp and cautery vaginal hysterectomy may be indicated.

Percy, J. F.: Heat in the Treatment of Carcinoma of the Uterus. *Surg., Gynec. & Obst.*, 1916, xlii, 77.

It seems necessary to emphasize the fact that the correct application of heat in uterine carcinoma is not a cauterizing operation. Of the advanced cases 90 per cent are operable by the application of low degrees of heat. The results in this otherwise hopeless type of cases are sometimes surprisingly good. This is especially true if there are no secondary degenerative changes in the kidneys, liver, and heart.

For the purpose of statistics Percy insists that very advanced cases of uterine carcinoma should be classed with the palliative operations only. The heat method is the only one by which a gross mass of cancer can be destroyed. This results in an immediate improvement of the patient physically. Metastasis is weakened and if local recurrence develops, it is much less active. When convalescence is well established the heat treatment should be followed by repeated massive doses of X ray through the Coddage tube. He also insists upon the great value of his technique in converting a borderline inoperable case into one that is safely operable. In cases in the first and second stages, the author believes he is warranted in saying that 70 per cent will be found free from recurrence five years after one application of the low degree of heat.

Percy deprecates the use of the cold steel knife in any form of cancer, in any stage of development, and in any part of the body where the hot knife could just as well be used. The use of the knife and the curette, and active manipulation of the cancer-infected organ during hysterectomies are the most potent measures for encouraging a recurrence of the growth. The heat treatment inhibits dissemination, and manipulation of the mass is not necessary.

The low heat should be maintained until all the pelvic structures fixed at the beginning of the application are freely movable. To do less than this must, of necessity, defeat the object of the treatment which is the complete penetration by heat of all the cancer-infected area possible.

Boldt, H. J.: High Degrees of Heat vs. Low Degrees of Heat as Palliative Treatment for Advanced Cases of Carcinoma of the Uterus. *Am. J. Obst.*, N. Y., 1916, lxvii, 1.

The author gives a general discussion of the advantages of the two methods and reports a case, with complete autopsy findings and tissue study, which was treated with the low degree of heat as advised by Percy. While he admits that one case is usually not conclusive this record is of unusual value. He believes that the results of Percy's experimentation fall to the ground, since his work was done on dead tissue (beef), while his own deductions rest upon the action of heat on living tissue. He believes that his case shows with uncontrovertible positiveness the fallacy of believing that the effect of heat applied in low degrees (so low that dissemination only takes place) and kept in contact with the tissue upon

which its detrimental action on cell growth should be exerted over a long period of time, extends for any considerable distance beyond the surface to which the cautery is applied; nor can it exert its destroying effect upon deeper seated cancer-cells. This extensive action of heat was the belief which he had entertained, and because of this some—particularly Byrne—held that cancer was actually cured by heat, even when past the stage of a radical operation.

The author has used the heat treatment for a large number of cases of advanced carcinoma, but has never seen a case which was actually cured, although many have been made more comfortable and their lives prolonged.

High degrees of heat according to the author are to be preferred to the lower since the operation may be completed in so much less time. The only valid objection to the higher degrees of heat is the smoke and odor that occur during the operation. In extensive work he opens the abdomen so that an assistant may direct the vaginal operator's work. In some cases the internal iliac arteries are ligated, as was first suggested and practiced by the late Pryor. The cauterization is done through a water-cooled speculum.

The use of radium following the final desiccation treatment is commended by the author, since it can do no harm and it may be of much benefit.

C. H. Davis.

Conraden, J. A.: The Treatment of Uterine Hemorrhage by the Roentgen Ray. *Am. J. Obst.*, N. Y., 1916, lxvii, 23.

After a careful discussion of this subject the author draws the following conclusions:

1. The causes of uterine hemorrhage may be divided into two classes: (1) Those peculiar to the uterus and causing normal or pathological menstruation. (2) Those common to all parts of the body regardless of sex.

2. Menstruation is dependent on the activities of the corpus luteum.

3. Roentgen rays destroy the follicle apparatus of the ovary and thereby automatically bring about a menopause.

4. In the bleeding from the uterus without gross pathological lesion whether accompanied by changes in the endometrium or fibrosis of the arteries or myometrium, production of the menopause constitutes a cure. (1) In women over thirty-seven this menopause is made complete. (2) In women under this age the menopause is incomplete either with a temporary amenorrhea or merely a lessening of the flow.

5. All myomata which do not constitute an immediate or remote menace aside from that of hemorrhage are proper subjects for the production of the menopause, provided that ulcerative changes or pedunculated fibroids or polyps do not exist and provided that the possessor be over thirty-seven years of age.

6. All myomata which constitute a menace in women under thirty-eight should be excised rather than subjected to roentgen rays unless operation is contra-indicated.

7. In hemorrhage from malignant disease roentgen rays are contra-indicated. C. H. DAVIS

Nyulaay, A. J.: Uterine Displacements. *Surg., Gynec. & Obst.*, 1916, xvii, 105.

The ligaments of the uterus are its primary supports, while the pelvic diaphragm prevents undue stretching of the ligaments under the influence of intra-abdominal pressure.

The cardinal ligaments are the main support, holding the uterus at a more or less definite level in the pelvis. They are musculo-fibrous bands which pass outward from the side of the uterus and vaginal fornix; beyond the uterus they spread out into fibrous strands inserted into the pelvic wall and other parts, the bladder attachments being very important. The ligaments are exposed by opening up the uterovesical pouch. In prolapsus uteri they may be curtailed by bringing a loop of each onto the anterior uterine surface, and stitching it there (looping the cardinal ligaments).

The round ligaments maintain anteversion of the uterus. Overstretching with retroversion may be remedied by splitting the anterior layer of the broad ligament parallel to the round ligament, closing the opening by a silk purse-string suture (restoration of the round ligaments).

The uterosacral ligaments are tensors of the anterior vaginal wall and vesicovaginal fascia. Their curtailment lessens the cystocele of prolapsus uteri, and in the erect position helps to hold up the dropped organ.

The ideal procedure in retroversion should cause recontraction of the round ligaments. This is achieved by the operation of restoration of the round ligaments, which has been used in 30 cases without relapse.

For slight cases of prolapse an operation for retroversion, with curtailment of the uterosacrals, and six weeks' recumbency is adequate. In pronounced prolapse looping the cardinals, with restoration of the round ligaments is satisfactory, the hypertrophied cervix being excised. The injured pelvic diaphragm is repaired, but cystocele does not usually require interference. In obese breathless females vaginal hysterectomy is safer, but the stumps of the cardinals should be sewed to the vaginal angles.

Boldt, H. J.: Prolapsus of the Uterus. *Internat. J. Surg.*, 1916, xxx, 14.

Boldt confines prolapsus to those cases in which the entire organ or a part of it protrudes from the vulva. Surgical interference gives the only hope of permanent cure. Avoidance of physical exertion and mechanical support are only palliative measures. Non-healed vaginoperineal lacerations produce descent of the anterior or posterior vaginal wall and

are responsible for cases of partial prolapse. In marked prolapse the entire pelvic floor is relaxed. The early getting up after confinement unless complicated by pelvic floor injury has no bearing on uterine prolapse.

Indications as to the kind of operative procedure depend upon whether the patient desires more children or is beyond the childbearing period. Vaginal hysterectomy for prolapsus has no place in this domain of work. During the childbearing period the Gilliam operation combined with plastic work on the pelvic floor is the best for second degree descensus and cures 90 per cent of the cases.

Radical vaginal fixation is the author's operation of choice in cases of marked descensus and in partial or complete prolapsus. This method is known as the Watkins, Schauta, Wertheim, Doerrssen operation. The author cites a hypothetical case with the steps and technique of operative procedure. In patients with complete procidentia of the uterus and vagina, usually old women or widows who do not desire to marry, the author gets absolute and permanent results by total extirpation of the uterus and vagina, columnizing the vaginal tract.

H. G. GARWOOD.

Watkins, T. J.: Prolapse of the Bladder and Uterus. *Lancet-Clin.*, 1916, cxv, 72.

Prolapse of the bladder and uterus are hernias of these organs. The operative treatment should consist in the following:

1. An advancement operation with or without opening of the peritoneal cavity or vaginal fixation of the round ligaments. This is an advancement of the anterior vaginal wall and bladder upon the cervix or anterior wall of the uterus. The hernial opening is thus closed. It is valuable in cases of moderate amount, especially during the childbearing period. The peritoneal cavity is opened if needed for diagnostic purposes, for plastic surgery upon the ovaries or tubes, or for the purpose of vaginal fixation of the round ligaments, which is done for more extensive cases for retroflexion of the uterus.

2. Transposition of the uterus and bladder. In this operation the relative positions of the uterus and bladder are transposed. This is the ideal operation for the more extensive cases after the menopause. In very extensive cases this operation should be modified by excision of part of the anterior wall of the uterus or of the entire body of the uterus. In excision of part of the uterus the entire uterine mucosa should be excised if the cervix is extensively diseased. The anterior lip of the cervix should generally be excised if a high amputation is not made. In an experience of eighteen years with the transposition operation there has not been to the author's knowledge a single instance of recurrence of cystocele. There have been a few cases of variable amount of recurrence of prolapse of the uterus due, it is believed, to faulty technique. Perineorrhaphy is invariably indicated.

3. Complete excision of the uterine and vaginal mucosa and obliteration of both canals. This operation may be done in very extensive cases of complete prolapse where the patient is willing.

ADNEXAL AND PERIUTERINE CONDITIONS

Corner, G. W.: *The Corpus Luteum of Pregnancy as It Is in Swine*. Publication No. 212. *Cor. Rep. Institution*, Washington, D. C.

Corner has examined 128 pairs of ovaries from pregnant sows. He reviews the various theories as to the origin of the corpus luteum and favors those of Blaschke (1842), and Schroen (1863). That is, he believes that the yellow body is formed either from the epithelial layers of the follicle, the membrana granulosa, or that both follicular layers enter into its formation. He finds that while part of the theca may enter into the formation of the corpus luteum, in the sow, at least, some theca cells remain as distinct cells of special nature in the fully developed corpus luteum.

In pregnancy the cytoplasm of the lutein cell forms two zones, an inner dense one which the author calls endoplasm, and an outer one called exoplasm. This outer zone is full of granules and globules of various substances, giving it a vacuolated appearance, which he regards as evidence of activity and not of senescence. He does not find the yellow pigment granules, carotin, which characterize the corpus luteum of the cow.

Corner describes five periods in the development of the corpus luteum, as follows:

1. Preparation, pregnancy less than 25 days.
2. Height of exoplasmic development, pregnancy from 25 to 30 days.
3. Second part of exoplasmic development, pregnancy from 30 to 40 days.
4. Transition period, pregnancy from 40 to 75 days.
5. Period of endoplasmic development, pregnancy from 75 to 105 days.

The difference between the corpus luteum of pregnancy and that of ovulation is likened to the difference between an army and a mob. The first is in every way more regular and progressive. In ovulation retrogression begins before the corpus luteum is formed, so that the cells vary markedly in size and form, a striking characteristic being a greater infiltration of fat. CAREY CULBERTSON.

EXTERNAL GENITALIA

Smead, L. F.: *The Transposition of the Bladder and Uterus for the Cure of Cystocele and Descending Uteri*. *Am. J. Obst.*, N. Y., 1916, 1100, 131.

The author draws the following conclusions from his study of this operation:

1. The operation of transposition of the bladder and uterus developed from the operation of vaginal fixation.

2. Vaginal fixation aided the development of vaginal embryotomy and was directly responsible for vesicovaginal fistula of the uterus and vaginal fixation and shortening of the round and uterosacral ligaments.

3. Vaginal fixation has been discarded on account of recurrences and dystocia.

4. The history of the transposition operation really began in 1869, although it was first published by Doehrsen in 1864.

5. It is an operation for the cure of cystocele and incomplete prolapse in women who cannot become pregnant.

6. It is a simple, safe, and effective operation in properly selected cases.

7. The radical freeing of the bladder and its proper care after the operation are essential to success.

8. The operation is applicable in a smaller number of cases than vaginal hysterectomy for prolapse.

9. The shortening of the uterosacral ligaments is an important feature of the operation.

10. The principle of transposition is now applied in several operations including vaginal hysterectomy.

C. H. DAVIS.

Sturmdorf, A.: *Tracheloplastic Methods and Results; a Clinical Study Based upon the Physiology of the Mesometrium*. *Surg., Gynec. & Obst.*, 1916, XXII, 93.

The functional disturbances revealed in a critical analysis of 128 complete post-operative histories from among 400 cases recorded during the last 20 years indicate that the prevailing convictions as to the uniformity in the beneficial results of established tracheloplastic methods, i.e., trachelorrhaphy and cervix amputation, demand a most radical revision.

The dominating fundamental factor that establishes the morbidity of a cervical lesion is the incidence of infection. Clinically, the course of such infection assumes one of two types: First, as a form of puerperal sepsis with subsidence of its systemic manifestations or, more commonly, it pursues a more or less insidious latent course from the beginning.

The first form usually merges into the second, so that ultimately both eventuate in varying degrees of the same symptom-complex.

The objective and subjective features presented in this chronic stage of the condition are depicted in every textbook, but the nature and significance of the intermediate pathologic phases in the morbid chain that links cause and effect are obscured by a haze of standardized misconceptions.

The functional integrity of any organ depends essentially upon the maintenance of a uniformly normal circulatory equilibrium. This is conspicuously true of the uterus, whose specific activity in menstruation and pregnancy demands a range of local circulatory oscillation that obviously implies the existence of some regulating mechanism.

From time immemorial we have been familiar with the characteristic contractile phenomena manifested by the uterus during pregnancy and labor, nevertheless this identical contractile function as the intrinsic and essential regulator of its normal circulatory balance, remains unrecognized.

It is a perversion of this muscular function, impairing the intensity and rhythm of the uterine contracting cycle, which we must learn to recognize as the underlying morbid link between cervical lesions and their clinical manifestations.

This contention finds its substantiation in the morphology and myodynamics of the myometrium.

In the uterus as elsewhere, every infection incites the greatest reaction in its lymphatic elements.

The uterine lymph current may be traced from its lacunar origin under the endometrium and cervical mucosa, through minute funnel-shaped ostia directly to the myometrium, where it expands into an extensive capillary net, which, utilizing the perimysium as a scaffold, enmeshes every fascicle and bundle of the uterine musculature to its sub-peritoneal surface.

This arrangement of the lymphatics makes it clear how an infectious process of the cervix inducing an ascending intramuscular lymphangitis may splint and immobilize the elementary muscle bundles by plastic infiltration of their sheaths.

This intramuscular lymphangitis and its resulting impairment of the normal myometrial contractions furnish the pathologic factors that link cervical lesions to their clinical manifestations.

It is an axiomatic surgical principle in the control of any progressive ascending lymphangitis to direct our therapeutic aim at the primary infectious focus.

With the cervical lesion as the portal of infection, trachelorrhaphy should find its cardinal and practically its only sphere early in the puerperium, during which period the "immediate" or "intermediate" operation represents an effort of the highest prophylactic potency.

Early operation purposely or unavoidably omitted and chronic infection ensuing, Emmet's classic trachelorrhaphy as a curative measure presents itself for consideration.

The dominating features of this operation consist of a surgical reproduction of the original tear and its sutural reunion; this at once limits the curative scope of the procedure to cases in which the infection has not extended beyond the borders of the original tear—a rare condition, for we know today that the functional disturbances following cervical lesions, which demand surgical intervention, signalize the infectious invasion of areas beyond the limits of the primary injury and that the conservation of these invaded areas within the cervix perpetuates the morbid process; but a more sinister menace obtrudes itself into this question today; namely, the enhanced cancerous potentialities in the chronically inflamed cervical areas beyond the range of the Emmet operation.

In thus restricting the applicability of trachelor-

rhaply to the puerperium, we necessarily augment the range of cervix amputation as the reparative method of choice for all chronic cervical lesions, and it remains to elucidate and obviate those derangements noted as following upon this operation.

Both the cause and prevention of these post-operative disturbances are revealed as inherent in the technique of the prevailing methods of cervix amputation.

The very initial steps in the customary procedure, namely, dilatation and curettage, inflict a useless and most unsurgical traumatism that is not countenanced in any other operative field under similar conditions.

In the next steps, namely, circular ablation of the cervix and suture of its vaginal and endometrial margins, the purpose is frequently defeated by disregarding the physiological and textural features of the cervical elements. For on ablating the cervix in the usual manner, all the muscle stumps are made to terminate at the same level, the longer peripheral fibers contracting to a higher plane than the shorter central fibers tend to pull the vaginal and endometrial margins of the stump asunder; furthermore, the extreme friability of the endometrial edge renders its sutural retention purely transitory, so that, sooner or later, the flaps separate and expose a raw beveled cervical stump.

To fulfill the physiological demands, to meet the pathological indications, and to obviate the technical shortcomings enumerated, a method has been evolved, which has withstood the extensive critical test of results during a period of over three years in public and private service.

The specific features of this procedure effect the complete elimination of the infectious focus by extirpation of the diseased cervical mucosa; preserve the normal arrangement, contour, and functions of the cervical musculature; obviate the mechanical difficulty and secure the permanency of accurate sutural coaptation of flap to stump.

As already emphasized, the dilator and curette are absolutely excluded from the armamentarium for this operation.

The main object in the first step is the formation of an ample mobile cuff of vaginal mucosa; with this in view the outlining incision is carried around the cervix closely skirting the demarcating border between its healthy vaginal sheath and the diseased mucosa, running parallel to the indented line at the lacinated points. The edge of vaginal covering thus outlined is freely mobilized by blunt dissection from its underlying tissues completely around the entire cervix up to the level of the internal os, exposing the circular arteries as for high amputation.

In very extensive lesions it becomes necessary to brush the lower pole of the bladder from its uterine and vaginal attachments for a sufficient distance upwards. The pointing everted cervical mucosa is then circumcised and cored out of its muscular bed as a hollow cone, leaving a raw funnel-shaped cavity. Trimming the loose vaginal cuff

to serve as an accurate lining to the interior of this muscular tunnel its retention in this position is secured in the following manner:

Beginning with the anterior segment of the circular flap, a long strand of heavy silk wormgut is passed on its vaginal surface transversely through the free border of its central tip, one eighth of an inch from the edge, like a mattress suture, the entrance and exit of the strand embracing a quarter inch of tissue. The right free end of the suture is then carried into the cervical cavity to a point just above the internal os, where, piercing all the tissues in a direction forward, upward, and to the right it emerges from the vaginal surface at the base of the flap.

The left free suture end, after reaching the same point above the internal os, passes in forward, upward, and to the left, so that the two free ends, diverging in their transit, reappear on the surface of the anterior vaginal fornix, about one-fourth inch apart, where they are left loose for the time.

The suture course for the posterior flap segment runs parallel to the above, but in a posterior direction, its free ends emerging on the surface of the posterior vaginal fornix.

Now by tightening each individual set of suture ends, the flap segments are drawn into the cervix, lining its whole cavity with vaginal mucosa, the edge of which is thus approximated to the circumference of the internal os where it is retained in apposition as long as desired.

In most cases no further suturing is necessary or desirable, but, should either lateral edge gape, an additional chromic stitch may be introduced. The suture ends are left long to facilitate removal.

For greater ease and control in directing the suture through the cervical tissues, a double curved Peaseley needle should be substituted for the round needle, after engaging the tips of the flap in the first stitch.

A narrow strip of iodoform gauze is introduced with the object of maintaining a flat uniform coaptation of all raw surfaces. This gauze is removed after the fourth day, when the patient is permitted to leave the bed and walk about. The silkworm gut is removed after two weeks, when the loops are found loose and accessible.

MISCELLANEOUS

Leighton, A. P., Jr.: The Use of Luteum Extract in the Treatment of Menstrual Disorders. *Med. Press & Circ.*, 1916, 6, 9.

The author briefly reviews some of the recent ideas regarding the physiology of the corpus luteum and reports his results in the treatment of irregular and painful menstruation by organic therapy. While not ideally successful he regards this treatment as very satisfactory in certain cases. Even better results have been obtained in cases where premature menopause has been brought about by operation. He regards corpus luteum as best indicated in those patients who show severe nervous phenomena such

as irritability, malaise and depression, accompanied by headache and scanty menstruation.

In dysmenorrhea, too, the author has seen some startling results after feeding corpus luteum extract. This has led him to suggest a plausible explanation for the so-called congestive or membranous type of dysmenorrhea. In addition to acting as a vasodilator of the uterine capillaries, the ovarian hormone has perhaps a further selective action in exciting or stimulating an intracellular or autolytic enzyme in the endometrium, which so softens and digests the histological elements of this tissue that the physiological phenomena of diapedesis, rupture of hematoma and exfoliation of mucous membrane are made possible and easy. Where, then, the ovarian hormone is altered or lessened, it may fail to excite in sufficient amount the uterine autolytic enzyme with the result that the endometrium, lacking its proper preparation and softening, acts as a barrier to an easy escape of blood. The congested membrane hence remains to form a foreign body and set up uterine spasm, or becomes detached in the comparatively large portions that are characteristic of membranous dysmenorrhea. Therefore, cases most suitable for corpus luteum therapy are those characterized by excessive first-day pain, with scanty discharge, followed later by a free flow and immediate relief from pain.

CAREY CULBERTSON.

Sanca, K. I.: Menstrual Statistics; a Study Based on 4,500 Menstrual Histories. *Am. J. Obst.*, N. Y., 1916, LXIII, 93.

The author has made a very careful statistical study of over 4,500 menstrual histories from the records in his office, and while they may not be as accurate as one might wish for an ideal study, they are from histories taken with special attention given to accuracy in securing the menstrual data and are therefore as nearly correct as they can ordinarily be made.

Seventy-five per cent of the women menstruated regularly and 25 per cent irregularly. The most common type met with was that of 28 days, which constituted 73 per cent of the cases. The 30-day type followed next in frequency with only 3.8 per cent, and the 21-day type with 3.3 per cent, etc. In some of the 31-day type the menstrual flow appeared monthly on the same date independent of the number of days in the month. The common irregular types were 3 to 4 weeks, then 4 to 5 weeks, 2 to 3 weeks, 5 to 6 weeks.

The most common ages of onset in the order of their frequency were 13, 14, 15, 12, 16. The age of onset did not show any relation to regularity or irregularity of menstruation. The earliest age of onset in the author's series was 9 years and the latest 24 years.

The common duration of the menstrual flow was 3 days, then 4 to 5 days, 2 to 4 days, 1 day, 7 days, and 4 days. The irregular type of menstruation showed a larger percentage of long duration and

smaller percentage of shorter duration than the regular type.

The quantity of flow in 43 per cent of women was normal, in 17 per cent scant, and in 37 per cent profuse. Irregular patients showed a higher percentage of profuse flow than the regular ones. Hyperthyroidism cases showed a very high percentage of profuse menstrual flow, 63 per cent.

Clots were very frequently found in menstrual flow and the author did not find them to be influenced by menstrual irregularity.

Of the series 47.4 per cent suffered from dysmenorrhea, if the term dysmenorrhea conveys the idea of discomfort. In retrodisplacements the percentage was found to be 50.4 per cent. In 50 per cent of the dysmenorrhea cases the symptoms appeared during the flow in 20 per cent, before; in 17 per cent, before and after; and in the rest after the flow or during and after. Most frequently the dysmenorrhea appeared the day before the flow, then the first day of the flow, then 2 days during, 2 days before, 1 day before and 2 days during, then 3 days before, and 7 days before.

Improvement in menstruation was frequently noticed with the advance of menstrual life, after marriage, and after childbirth, the menstrual period becoming more regular and the dysmenorrhea improving or disappearing entirely.

The most common ages of menopause in the order of their frequency were given as 50, 46, 48, 47, 51, 49, 44, 45, 52. The length of menstrual life was most commonly given as 37 years, then 35 and 33. Sixty-eight per cent reported a menstrual life of thirty years or more. The very early and late ages of puberty showed an early menopause.

The paper is accompanied with many interesting and useful tables.

C. H. DAVIS.

Wilcox, D. G.: The Treatment of Pelvic Adhesions. *N. Eng. M. Gaz.*, 1916, li, 35.

The author seeks first to show how Nature deals with infected and threatened suppurative viscera of the pelvis and abdomen. Upon the first intimation which Nature receives that a perforation of any of the abdominal viscera is about to take place, she loses no time in preparing for the catastrophe by commandeering all adjacent structures and cementing these structures to the weakened spot in the viscera.

He calls attention to the fact that not infrequently a young girl will have appendicitis, will recover without operation and remain well until she begins to menstruate; then she becomes more or less of an invalid from pain in the right ovarian region. If this is allowed to go unattended she may be rendered miserable for the rest of her days. She may even become sterile in consequence. The cause of all her trouble is due to a leaky or ruptured appendix which allows pus or infected serum to trickle down upon the right tube and ovary and there sets up a perisalpingitis or ovaritis with resulting adhesions. This occurs not infrequently where cases of ap-

pendicitis are allowed to go without surgical treatment. Any condition causing a localized peritonitis may leave in its trail adhesions of tubes, ovaries, or uterus.

It is well recognized by all gynecologists that a woman who has adhesions of the uterus or adnexa to any great extent is an invalid according to the density and extent of those adhesions. The reason she is an invalid is:

1. Because these organs bound down, twisted or bent by exudates, cannot properly functionate. If she is a young woman she will in all probability have a distressing dysmenorrhea which did not appear prior to the adhesions. Also, she is likely to be sterile because the tubes are occluded, or the fimbriated end closed.

2. She is an invalid because she is subject to recurrent attacks of acute localized peritonitis, due to an escape of pus or serum from a partially occluded tube.

The more dependable evidences of pelvic adhesions are summarized as follows:

1. A dense inelastic pelvic floor. In attempting to push up the cervix with the inserted vaginal finger, or to push down upon the uterus with the abdominal hand, a rigid pelvic floor is found which permits of no freedom of motion on the part of the uterus or cervix. That in itself is almost diagnostic of pelvic adhesions.

2. Unusual and general pelvic sensitiveness. It is rare that one finds a uterus bound down by adhesions where the tubes and ovaries are not implicated; hence, there must be sensitiveness in such cases.

3. The presence of a tumor or mass behind or on either or both sides of the uterus. This tumor is usually composed of tube and ovary with a mass of exudates holding these structures just behind or at the side of the uterus. These masses are always sensitive, in which point they differ from a small fibroid or an ovarian cyst which might be found in the same locality.

4. The position of the uterus. If adhesions have formed after a woman has had one or more children the chances are quite strong that the fundus will be found well fixed in the hollow of the sacrum. If she has not borne children the fundus may be in its proper position, but whether nullipara or multipara the fundus is more likely to be retro-displaced, and when so, it is almost impossible to lift it above the promontory of the sacrum.

The author emphasizes the danger of inserting a pessary in a woman suffering from an old time salpingitis, the traumatism of which may be just sufficient to cause a tear in the adhesions, with a fatal infection following.

The author next refers to the value of glycerine, iodine, or ichthyl impregnated for a certain class of these sufferers and how in many instances these applications if properly administered will melt down the adhesions and give marked relief.

As to operations, he says, "After all these measures have been diligently and intelligently employed

there will remain a certain proportion of patients who must come to operation or remain confirmed invalids, and it becomes the duty of physicians treating such cases to make a careful study in the selection of them in order that neither they nor his reputation may suffer thereby. There is no hard and fast rule laid down for the determination of the operative cases and the non-operative; each must be studied upon its own merits. But any patient who is suffering from pelvic adhesions due to an old-time attack or inflammation of some of the pelvic organs, no matter how severe or how long, stands an excellent chance of being permanently cured by the employment of some of the herein mentioned methods of treatment."

The use of the Crump oil for the purpose of preventing post-operative adhesions is strongly endorsed.

Sullivan, A., and Spaulding, E. R.: The Extent and Significance of Gonorrhea in a Reformatory for Women and a Consideration of the Treatment of Venereal Disease Among Delinquents. *J. Am. M. Ass.*, 1918, lvi, 95.

After discussing the question from its many angles the authors conclude as follows:

Three methods present themselves as means of dealing with venereal disease among delinquents:

1. The medical problem of venereal disease is very closely associated with mental and social problems. Among the 24 per cent of 500 women who, after careful study, have been considered candidates for permanent segregation, syphilis was found in about 61 per cent while gonorrhea was found in over 90 per cent. These women have proved themselves to be irresponsible members of the community. They are all defective intellectually according to psychologic tests. They have, besides a bad social record, no home where they can be given suitable supervision. If their segregation is provided for not only is their immoral influence removed from society and the continuance of similar types in the next generation prevented, but just so much actual disease is removed from the community.

The argument may be brought forward, particularly by the layman, that most of the women, especially in the mill towns, associate only with their own type, and so society as a whole is not endangered. Even if this were true, the tendency would be for individuals to be infected who, if crippled mentally or physically by disease, would become public charges and an additional expense to the taxpayer. This would be an additional argument, economically, for the permanent segregation of mental defectives, especially among delinquents.

Before such segregation is possible, however, greater facilities must be furnished by the state for

the care of these defectives, and the judges, through whom the commitments must be made, must be shown the need of such segregation.

2. The second method of combating the disease would be the early diagnosis and the intensive treatment of all persons who pass through the courts and are detained in public institutions on any charge.

The ideal treatment of prisoners, according to the most advanced criminologists, is the mental, physical, and social examination of all persons before they are seen by the judge. When such information is obtained before trial, the fact that the prisoner needs treatment for diseases so dangerous to public welfare should influence the judge in his decision, especially when the offense of the prisoner tends to spread such disease. As a help toward this, a law is already in existence in Massachusetts which provides for the treatment of syphilis while the disease is in a communicable form.

As over 25,000 persons were sentenced to penal institutions during the year ending September 30, 1914, it would seem possible, by suitable treatment, to accomplish much under the present régime. This should include the universal application of the Wassermann test and the bacteriologic tests for gonorrhea, with insistent treatment for the two diseases while in the institution. The indeterminate sentence makes it possible usually to hold gonorrheics until they have cleared up clinically, while the law mentioned above would make it possible to hold syphilis as long as it seems necessary.

3. The third and most important method would be the provision of hospitals throughout the country for the treatment of such persons, if necessary, free of charge. Even in the time of Henry VIII there were six hospitals in London devoted to the treatment of venereal patients. Even though, in this present generation, hospitals for the exclusive treatment of venereal disease are not considered feasible on account of the stigma which would be attached to them, there seems to be no argument against special wards in all hospitals where such treatment could be given.

While a segregated district and attempted medical supervision of prostitutes is not recommended, yet there is limitless opportunity for treatment in the place of the present existing conditions. Fortunately, in Massachusetts the hospitals are beginning to admit patients with these two diseases.

The three methods of treatment which have just been described lie within the province of the physician. Although it is outwardly a social problem and calls for legislation and much social effort, it is fundamentally a medical one and will only progress as the physician appreciates his responsibility and enlists his interest and industry.

EDWARD L. CORNELL

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Heineberg, A.: The Diagnosis of Tubal Pregnancy; a Critical Study of Seventy-five Consecutive Cases. *Penn. M. J.*, 1916, xix, 267.

In a study of seventy-five cases of tubal pregnancy Heineberg brings out the most important symptoms of ectopic gestation. He divides the cases into two classes: (1) before any interruption in the course of the tubal pregnancy has occurred, and (2) after the pregnancy has been interrupted in one of several ways.

Interruption usually occurs before the fourteenth week. Pain is practically the only symptom of an early uninterrupted tubal pregnancy. It may be of varied severity, but it is always paroxysmal in character. Occasionally it is followed by faintness or actual syncope and symptoms of shock. The pain is usually located in the lower quadrant of the abdomen on the side of the pregnant tube and may radiate down the leg of the corresponding side. It is increased during defecation.

Early examination reveals the embryo in the tube as a spindle-shaped nodule, soft, doughy and quite sensitive to the touch. Later the mass enlarges and, as a rule, drops into Douglas' cul-de-sac. It may vary in shape, becomes more elastic and resilient but is still tender. In order to make an early diagnosis before rupture occurs Heineberg urges pelvic examinations in pregnancies accompanied by unilateral colicky pain.

Interruption in the progress of tubal pregnancy occurs usually in one of three ways: (1) by mole formation, (2) rupture of the tube, (3) tubal abortion. The last two methods of termination may occur independently of mole formation, but are frequently preceded by it.

Tubal abortion or rupture usually occurs before the fourteenth week, the average being about the eighth week. The symptoms accompanying this sudden, or "tragic," termination are classical: sudden, severe, cutting pain, usually in the iliac region on the side of the pregnancy; frequently fainting, followed by symptoms of concealed hemorrhage, such as pallor, restlessness, thirst, air hunger, increasing weakness, faintness, dark spots before the eyes, increasing pulse-rate, and decreasing arterial tension. The pulse-rate may, however, not increase for two or three hours after rupture has occurred. Abdominal tenderness and rigidity soon appear and may extend farther than the lower part of the abdomen. Hemorrhage from the uterus occurs in over 90 per cent of these cases. The symptoms noted are modified as to severity in cases of more insidious onset with slow bleeding,

presenting the "non-tragic" type of ectopic gestation. Here the most significant symptom is uterine hemorrhage, which is continuous from the onset; the blood is not profuse as a rule and is darker than menstrual, slimy, and frequently contains shreds of decidua membrane. Pain is of varied character, but constant as to location and tendency to recurrence. It is always severer during defecation and urination. Early, the pain is due to a mild peritonitis caused by the presence of free blood in the peritoneal cavity; later, by pressure of the pelvic hematocoele upon the rectum. Slowly progressive anemia is present. Differential diagnosis from uterine abortion, ruptured pyosalpinx, appendicitis, and inflammation of other abdominal organs, twisted pedicle of an ovarian cyst, and acute intestinal obstruction can be made by the careful study of the histories and symptoms of these cases, the uterine hemorrhage being of utmost importance. If the usual methods fail, a posterior colpotomy will help to clear up the diagnosis. L. R. Goudswaard.

DeLee, J. B.: The Newer Methods of Cesarean Section. *Illness M. J.*, 1915, xviii, 47.

The author gives the early history of cesarean section and briefly reviews the development of its technical execution.

On account of the danger of infecting the peritoneum, operators sought a method of delivering the child from beneath the peritoneum. Twenty or more methods have been devised for this. They may be divided into two classes, (1) the transperitoneal and (2) the extraperitoneal.

In the transperitoneal operation the belly is opened above the pubis, and the peritoneum over the cervix and near the bladder is incised and loosened from its bed. By means of closely set continuous sutures, or by clamps, the parietal and visceral peritoneal layers are united. The lower uterine segment and cervix are then incised, the child delivered, the placenta following; then the uterus is closed and the double layers of the peritoneum also reunited. The peritoneal cavity thus is temporarily removed from the field of operation and infectious matters, such as mucus, liquor amnii, blood, etc., are not permitted to soil the general peritoneal cavity. Some operators cut the line of sutures and reunite the individual layers of peritoneum. Others sew the two layers together. Sellheim sews the uterine wall to the skin and leaves the wound open to drain, and calls it a delivery through a utero-abdominal fistula.

Among transperitoneal cesarean sections, that invented by Kronig and modified by Gellhorn of St. Louis seems to possess most advantages. The

patient is placed in a high Trendelenburg position, thus allowing the uterus to fall away from the pelvis, stretching the lower uterine segment over the head. A median incision is made from the pubis to within two inches of the navel. The peritoneum is opened as usual, having a care of the bladder, which may be very high. The peritoneal line of junction with the bladder is determined and lifted up with forceps. A short transverse incision in the peritoneum is made, similar to that for amputation of the uterus. The peritoneum and bladder are pushed off the anterior wall of the uterus well down toward the external os, uncovering the muscle of the lower uterine segment for a space large enough to make a four and one-half inch incision. The thin lower segment is carefully incised. The head is delivered by forceps after pulling the face into the opening. The placenta is expressed, the uterus cleaned out, packed if need be, and the incision carefully coapted by two rows of sutures closely set. Then the peritoneum and bladder are drawn up over the line of sutures and united on the face of the uterus. Gill-born's modification consists in uniting, temporarily, during the time of delivery, the parietal to the visceral peritoneum with a continuous suture. This is necessary only in infected cases.

Of the extraperitoneal methods, that of Latzko is the best. In Latzko's operation the incision is made either transversely or longitudinally, just above the pubis. The peritoneum is pulled out of the pelvis and the bladder is pushed off of the cervix to the right. Beneath the vesico-uterine fold, which has been pushed up toward the navel, a bare space of cervix and lower uterine segment is provided, through which the child is delivered.

These newer methods do not entirely remove the danger of infection, adhesion, and subsequent rupture. In severe infections any form of section is dangerous. On the other hand, some cases recover no matter what method is used. In several cases the child has died shortly after delivery.

Peritoneal adhesions are not entirely eliminated by the newer methods. The danger of rupture in subsequent pregnancies has not been definitely determined. On account of scar formations a second extraperitoneal section may be impossible.

The newer methods permit of greater latitude in cases of mechanical dysdysia, allowing a thorough test of labor. Technically the operation is more difficult than the classical cesarean section.

D. H. Boyd

Planchu: Cesarean Operation Done for the Fourth Time upon the Same Woman; Subtotal Hysterectomy (*Opération césarienne pratiquée pour la quatrième fois chez la même femme; hystérectomie subtotale*). *Ann. de gynéc. et d'obst.*, 1916, xlii, 45.

The woman reported upon by Planchu had undergone three prior cesarean sections on account of contracted pelvis. At the third section Planchu observed considerable thinning of the wall in the site of the previous scars and thought he could

effect sterilization sufficiently by ligating the two tubes. In addition later on during an operation for eventration following the cesarean section the left adnexa were ablated. Nevertheless the woman again became pregnant, and cesarean section was again done, supplemented by a total utero-ovarian castration. Examination of the uterus showed a thin zone of wall about 2 cms. wide in the site of the old scars in which the muscular tissue was in great part replaced by fibrous tissue. This was resistant enough save in one point where the wall was only 2 to 3 mm. thick. Rupture would have undoubtedly occurred if the placenta had become adherent at this point.

A. Goss

Gilles, R.: A Third Conservative Cesarean Section upon the Same Woman; Operated at Term in the Course of Labor; Twins Born (*Troisième césarienne conservatrice chez la même femme, opération à terme et au cours du travail; accouchement gémellaire*). *Ann. de gynéc. et d'obst.*, 1916, xlii, 12.

The woman whose case is here reported was a rachitic multipara. Her two previous pregnancies had been terminated by cesarean section. Her present pregnancy began March, 1913. She entered the hospital at the eighth month. Labor began early in December spontaneously. Operation was performed immediately. Incision and resection of the cicatrized band resulted from the prior cesareans. The uterus, immobilized by adhesions, was opened by median section. There was but slight thinning of the wall in the sites of the old scars. Twins were successively extracted, weighing 2,580 and 2,350 grams. After some hemorrhage and the insertion of a drain, the uterus was sutured in two layers and the abdominal wound closed without drainage.

A. Goss

Grosze: Uteroparietal Fistula Consecutive to a Cesarean Operation; Second Cesarean; Hysterectomy (*Fistule utéro-pariétale consécutive à une opération césarienne; deuxième opération césarienne; hystérectomie*). *Ann. de gynéc. et d'obst.*, 1916, xlii, 33.

Grosze points out that uterine fistulae have become more frequent owing to the extended use of the cesarean operation. Parville in his recent thesis collected 15 cases. The author reports another. The first cesarean section was done in 1910, followed after three months by abscess and fistula. In May, 1912, the patient had a miscarriage followed by the elimination of blood-clots, etc., through the fistula. Three years later she became pregnant. Cesarean section was done before the onset of labor, and on account of the fragility of the former scar site the operation was completed by a hysterectomy.

A. Goss

Burnett, S. G.: Toxic Palsies Complicating Pregnancy. *Med. Record*, 1916, xxv, 1.

This paper deals with a classification of the toxic palsies of pregnancy, with a review of the literature.

with some of the author's case reports, and with a summary of his discussion of this troublesome complication.

The diagnostician must differentiate three different clinical pictures, viz.:

1. Paralysis limited to the mental field, characterized by a symptom index picturing mind perversion, a result of damaged memory function, namely, limited or lost memory for recent or present events; disorientation, that is, loss of memory for a time, meaning the hour, the day, the week, the month, the year, and place; misidentification, that is, loss of memory for identifying things, persons, or objects; confabulations, that is, loss of memory for connected description of past and present events, creating a fictitious or delusional mental field with a mingling of depressive and roseate and buoyant descriptions of flower strewn journeys unmade and picturesque episodes not real.

2. Paralysis limited to the somatic field, characterized, by a single nerve trunk palsy limited to a single muscular group, or more; by a paralysis of one or more of the extremities, or all of the extremities, till the only movement left is the head rotation; by a paralysis that is limp and flaccid, with atrophy and the electrical reaction of degeneration present in proportion to the completeness and duration of the paralysis; by a mixed nerve paralysis, giving motor and sensory symptoms.

3. A clinical picture made up of a combination of the mental and physical symptom groupings. This is very confusing to the attending physician. He invariably interprets the mental symptoms as meaning puerperal insanity when in fact there is an organic disease present.

The following cases are reported by the author.

Case 1. Multipara, third pregnancy, mental symptoms so severe at the third month as to require abortion. Complete recovery in ten months.

Case 2. Multipara, second pregnancy, intense vomiting appearing in the third month and continuing to term. A week after confinement her only voluntary movement was rotation of the head. No mental symptoms developed, and complete recovery was made in one and a half years.

Case 3. Multipara, 5 months along in the fourth pregnancy with a history of severe vomiting in each of her former pregnancies. She showed both mental symptoms and general mild paralyses with numbness and disturbances of sensation. Abortion was performed and a dead fetus delivered. The patient recovered completely in one year.

Case 4. Multipara, aged 38, in the fifth pregnancy, severe vomiting for the past four months; the patient delirious at times. The uterus was delivered of a putrid seven months' fetus. The legs were weak; she had bilateral toe-drop, also paresthesia in the hands. Five days later she had no use whatever of arms or legs, mental confusion was complete. She was convalescent after four months.

Autopsy reports of patients dying of this trouble showed parenchymatous degeneration in the dorsalis

pedis, ulnar, median, phrenic, abducens, acoustic, vagus, peroneal, anterior tibial, sciatic, anterior crural, pneumogastric nerves, all of the posterior cord roots; posterior cord columns, and direct cerebellar tracts showed scattered areas of degeneration. The anterior horn cells and Clarke's cells showed a chromatolysis around the nucleus in the body and the periphery. One case showed degenerative changes in the liver and kidneys.

The intent of this paper is to show:

1. The seriousness of a toxic palsy state in the pregnant woman, endangering her life, her mind, her physical well-being.

2. That the brief repetition of the symptom picture in the cases reported will make it easy for the observer to remember.

3. That primiparae are seldom affected but multiparae are.

4. That an early abortion will prevent a complete paralytic, or mental attack.

5. That the pregnant state may slip something into the chemistry of metabolism, causing a toxic neural inflammation symptom syndrome resembling that of Korsakow's disease, but differing from Korsakow's disease in the acuteness of the toxæmia, more often causing death by attacking the phrenics and pneumogastrics.

6. That the neural inflammation complicating pregnancy may be confined to a single nerve trunk, to one limb, to all the limbs including the trunk, the diaphragm, one or more of the cranial nerves, or, the pneumogastric alone, causing death, or, to the intracerebral structures; namely, the brain cells and their association neurons causing only mental symptoms with or without delirium, minus fever.

7. That severe and uncontrolled vomiting usually precedes a general paralysis; that the vomiting is milder or absent in the mild or restricted palsies, indicating a severe or mild underlying toxæmia, respectively.

8. That we are derelict in duty if we fail to advise against a subsequent pregnancy when a previous hyperemesis gravidarum has occurred; that the serious toxæmia is dangerously apt to recur in intensified form.

C. D. HENRIK.

Brooks, C. M.: Glycosuria in Pregnancy. *Hahnemann, Month*, 1915, 5, 39.

During pregnancy either lactosuria or glycosuria is apt to be found. On account of the difference in prognosis it is important to differentiate these two conditions. Lactosuria may be present at any time when the breasts are functionally active and the escape of milk is impeded in any way. It is often of short duration, being present at one examination and absent at another. Lactose does not ferment yeast; responds slowly to the alkaline copper tests, and deflects polarized lights strongly to the right. The condition is not pathological and does not require treatment.

True diabetes during pregnancy is not frequent, because diabetes rarely occurs during the child-

bearing age, and because diabetes seldom become pregnant. Pregnancy may, however, occur in a true diabetic, or diabetes may develop during pregnancy and continue after delivery, or subside and recur with a subsequent pregnancy.

Tuiff has compiled the following data from 28 cases reported in the literature:

Number of patients.	28
Number of pregnancies.	56
Number of labors at term.	47
Number of miscarriages.	24
Number of mothers dying.	13
Number of children living.	31
Maternal mortality.	46%
Total mortality.	53%

In view of the high mortality the author seems to favor the induction of labor in patients whose symptoms are not relieved by approved methods of treatment.

C. D. HATCH.

Reider, F.: Surgical Operations During the Pregnant State. *Am. J. Obs., N. Y., 1916, lxiii, 96.*

Reider discusses the subject in its relation to the surgical conditions which more commonly arise with the pregnant state and draws the following conclusions:

1. A woman expecting to become pregnant should be thoroughly examined for any physical defect.

2. Such a defect should be corrected, if possible, before pregnancy takes place.

3. No operation that can be deferred should be performed upon a pregnant woman.

4. Any operation that will contribute to the safety of a patient should be performed without hesitancy.

C. H. DAVIS.

LABOR AND ITS COMPLICATIONS

Copeland, G. G.: Double Nuchal Displacement of Arms in a Footling Presentation with Breech Anterior, Chin Caught Above Symphysis Pubis. *Surg., Gynec. & Obs., 1916, xiv, 309.*

Copeland reports the case of a primipara, aged 29, seven feet in active labor, membranes already ruptured. The pelvic measurements were: anterior superior spinous 14 cm.; intercrural 27.5 cm.; antero-posterior 18.5 cm. Breech presentation was diagnosed. No fetal movements were felt nor heart sounds heard. The feet were crossed and incarcerated in the vagina. The feet were released, and labor proceeded naturally to the umbilicus; the os came down to the left front. That the fetus was alive was proved by kicking the sides of the feet; plantar flexion resulted. The cord was hard to pull down; it pulsated feebly. The maternal soft parts were closed tightly around the fetus and the uterus was tightly contracted. The assistant made suprapubic pressure; the pains increased. The patient was put under light anesthesia. The fetus made no advance. The first attempt to

reach the arms failed. The chest of the fetus was crushed in an attempt to get hold of the hands which were found to be at the sides of the neck. The anesthetic was deepened, but the uterus would not loosen. The arms and head would not turn with the body, nor be thrust up. The child died. Forceful attempts finally disengaged the right arm only after dislocation of the shoulder and fracture of the humerus. The left arm was brought down; the head was turned with difficulty, but was extracted easily afterward. The patient recovered speedily. The fetus weighed 7.5 lb. and was apparently normal.

Copeland believes that if he had seen the case before the membranes ruptured, he could have done a version, and the case been left to go on naturally as a vertex case, or forceps applied, since the bony outlet was apparently not contracted.

The case is of interest because of its extreme rarity and complexity. DeLee and Munro Kerr report cases of double nuchal displacement in breech presentation but not with head turned also. The patient was examined and there seemed to be no reason why she should not subsequently go through a normal labor.

Harper, P. T.: Contraction Ring Dystocia. *Am. J. Obs., N. Y., 1916, lxiii, 11.*

After discussing the subject the author briefly sets forth his views as follows:

Tonic and isolated contraction of Bandl's ring is not only a possible but also a not infrequent cause of dystocia.

It is usually associated with and secondary to other causes of prolonged and obstructed labor. The etiology may be obscure.

It is a major obstetric complication. The dangers to the child are those of intra-uterine asphyxia from continued pressure when the condition is unrecognized or allowed to persist indefinitely, and shock and asphyxia from attempts at operative delivery. The fetal mortality is high. The danger to the mother is the same as with all other operative obstetric procedures. The maternal mortality should be low. The dangers of tetanus uteri are remote.

There is no untailing symptom except obstruction.

The only positive signs are those obtained as a result of careful vaginal and lower uterine segment exploration.

Contraction ring dystocia is to be suspected in cases of second-stage delay when all other signs of dystocia have been eliminated or where those that persist cannot of themselves explain the obstruction, and search for the ring should be made at once.

Success in treatment depends upon early recognition of the tonically contracted ring, upon the early disappearance of the structure, and upon the early application of conservative methods of operative delivery.

C. H. DAVIS.

MISCELLANEOUS

Hart, D. B.: Inversion of the Ilium and Sacrum and Ischium and Pubes (Iliosacral and Ischiopubic Bony Segments) as Causes of Deformities of the Female Pelvis. *Edinb. M. J.*, 1916, xvi, 9.

Hart recapitulates the chief differences between the normal male and female pelvis. The male pelvis has heavier bones with well marked muscular attachments, while the female pelvis is roomier and larger and has flatter iliac bones. The true pelvis in the female has a greater capacity owing to its greater transverse diameters. The brim of the female pelvis is reniform, while that of the male is cordate. In the male, the narrow (70 to 75 degrees) pubic arch is contrasted with the wide (90 to 100 degrees) pubic arch of the female. The obturator foramen is ovoid in the male, triangular in the female, and in the male the foramina look more outward. The male sacrum is also longer and narrower. Additional points of dissimilarity found by anatomists are: the great sacrosciatic notch, which in the female is larger, almost rectangular in shape, with a longer periphery, has all its posterior boundary formed by the sacrum; while in the male it is smaller with its edges meeting above at an acute angle and has only the lower portion of its posterior boundary formed by the sacrum. In general, the female ilium is larger and its posterior boundary is less steep and more rounded than in the male. The greater size of the female pelvis is due to a wider pubic arch, a broader sacrum, and a larger ilium and sacrosciatic notch.

The origin of the differences between the adult male and female pelvis has been considered by several writers, Schroeder being the chief exponent of the mechanical theory of postnatal development. Fehling and Thompson, however, have noted that the fetal pelvis after the third month could be diagnosed as to sex both by the brim transverse and the sacrosciatic notch. Hart agrees that the ultimate shape of the pelvis is determined before birth, but that the lumbar curve of the spine, the greater curve of the sacrum, and the brim inclination to the horizon are due to postnatal influences.

To explain certain deformities Hart believes that the female pelvis may be considered as consisting of two segments: (1) ilium and sacrum and (2) ischium and pubis. In certain female pelvises either the iliosacral or the ischiopubic segment may be male and both types of "inversion" may produce serious deformity. The author reports seven pelvises showing one or the other of these peculiarities. Six may be classed generally as male iliosacral and one as male ischiopubic inversion.

Hart believes that these types have an embryological basis. He suggests that when the fetal germ and sperm cells are undergoing mitosis in the fetal sex glands certain determinants, which should normally be present, are absent by variation. The conjunction of a germ cell having no iliosacral determinants with a sperm cell having these deter-

minants would produce a female pelvis with male iliosacral inversion.

In the iliosacral form of pelvis the contraction is at the brim and requires cesarean section or pubiotomy. With the ischiopubic variety the contraction is at the outlet and may be formidable.

F. C. Jarvis.

Sloan, H. G.: The Diagnosis of Intracranial Bleeding in the Newborn. *Cleveland M. J.*, 1917, xiv, 848.

In case of difficult or prolonged labor, where there has been a difficult instrumental delivery, or where there is tardy starting of spontaneous respiration, the babe ought to be carefully watched for the next few days for evidences of cerebral bleeding.

Early symptoms of cortical irritation are most valuable in localization of the bleeding. Bleeding above the tentorium can be differentiated from that occurring below it. When symptoms of general increase in intracranial pressure become marked, a decompression operation should be done. The best results are seen when decompression is done while the pulse is still slow and before respiration becomes irregular.

In parietal decompression the babe should be well wrapped in a warm blanket and laid on several half-full hot water bottles. The whole head is shaved. The skin is prepared with alcohol after cleansing with benzine, and a rubber tourniquet applied around the frontal occipital circumference just above the ears. This tourniquet is put on after the head has been covered with a single layer of gauze saturated with alcohol. It is best to do these operations under as little anesthesia as possible, but where it is needed, a few whiffs of ether will suffice.

The incision is made through the skin and fascia down to the periosteum just inside the concave edge of the parietal bone, extending 1 cm. from the midline well down toward the ear and following the contour of the bone. The periosteum is then pushed aside along the concavity of the suture line and the edge of the suture opened sufficiently by a sharp knife through its cartilaginous border to allow the introduction of a pair of strong-bladed curved scissors. The bone is incised along an oval line about 1 cm. from and parallel to the suture line, care being taken to avoid the area of the suture because here the dura is adherent to the overlying cartilage. The base of the incision is made omega-shaped, that is, narrow at the bottom, and extends to just above the ear where the bone flap will be approximately 5 cm. in breadth. Here the bone is broken between two strong hemostats, care being taken not to damage the dura by the rough spicules caused by the fracture. The dura is picked up with needles and opened with a sharp-pointed knife. The incision is made about 1 cm. distant from the bone cut in order that the dura may be closed accurately. All vessels cut in the dura are divided between fine silk sutures, and the dural flap is reflected down.

ward. Dark coloration beneath the dura points to a blood-clot immediately beneath it. If the brain bulges, the base is very gently explored with a flat, smooth instrument, raising the brain in order to see if there is any unclotted blood mixed with the cerebral spinal fluid over the base. In case the blood is clotted, the clot is merely evacuated, the bone replaced, and the wound closed without drainage. In case the cerebrospinal fluid is mixed with blood and is unclotted, it is wiser to introduce a rubber tissue covering taken from a cigarette drain for the first 24 hours. If the bulging brain makes the closure difficult or impossible, it is wise to do a lumbar puncture in order to further relieve pressure before closing. Accurate closure of the dura is also highly necessary in order to avoid subsequent scar formation between the suture line and the cortex. Where no bleeding is found and yet the brain bulges markedly, it is advisable to do a bilateral decompression in order to allow for expansion arising from brain edema. Where ventricular bleeding is suspected, it is evacuated by a hollow needle.

EDWARD L. CORNELL.

Calderon, F.: Tropical Obstetrical Problems.
Philippine J. Sc., 1913, 2, 317.

The author records a number of superstitions relating to the pregnant woman in the Philippine Islands. The *duwang*, an active evil spirit, is supposed to have a great influence on the pregnant woman. The *duwang* being more troublesome at night, pregnant women stay in the house at night and keep a light or fire burning beneath the house to frighten away the spirit. If compelled to leave the house they let down their hair which prevents the *duwang* from transforming the child into another *duwang*.

If a pregnant woman eats rice-crust, the expulsion of the placenta will be delayed. If she voids urine on the ground, water must be poured over the spot of soiling otherwise the *duwang* will smell the urine and the woman will have a hemorrhage at time of labor. During the last three months of pregnancy, *paglalubog* is performed, which consists in turning the child in order to place it along the median line of the mother.

To facilitate labor the midwife or an assistant pushes on the fundus with the hand or a piece of wood, sometimes resulting in rupture of the uterus.

After the birth of the child the cord is not cut until the placenta is delivered. If the placenta is delayed the midwife pulls on the cord and pushes on the fundus. The placenta is buried in the ground, and if the hole is too small the baby will have a poor appetite and if too large the baby will be a glutton. The cord cut in pieces and hung on the eaves of the house is believed to prevent the disease of childhood.

After delivery the operation of *paglalubog* is performed on the mother. The midwife and assistant squat on each side of the woman, grasp hands across her body and compress the pelvis with their feet.

If there is post-partum hemorrhage the mother's hair is bound tightly on the top of the head. A tight abdominal binder is always worn and the abdomen is massaged every day for eight days. No bath is given for ten days and then in an extract of the leaves of certain plants.

In order to educate the public and improve the service the obstetrical department of the University of the Philippines has instituted a series of lectures and conferences dealing with subjects pertaining to pregnant women, care of the baby, etc.

The number of confinement cases with medical assistance has been increased from 3 per cent to 70 per cent in the city of Manila.

The following table shows the number of cases and complications from July, 1907, to December, 1914.

	Hospital	Out-side	Total	Per Cent
Complications				
Placenta prævia	103	15	118	4
Retained	111	3	114	1
Postpartal infection	113	4	117	3
Operations				
Forceps	158	69	227	6
Perforation	124	15	139	3
Embryotomy	15	—	15	—
Cæsarean section	16	—	16	—
Laparotomy for abdominal pregnancy	—	—	2	—
Maternal deaths				
Placenta prævia	—	—	16	65
Retained	—	—	18	45
Postpartal infection	—	—	19	15
Other causes	—	—	51	—

Placenta prævia is frequent, due to the defective management of previous labors.

The indication for forceps was chiefly inertia. In transverse presentation seen early, version was performed; in neglected transverse cases, embryotomy was resorted to.

Placenta prævia was the indication for cæsarean section in all but one case it being an intrapartum eclampsia in a primigravida. Three patients on whom section was performed have since had normal spontaneous deliveries.

Contracted pelvis is rare although the Filipino woman has a small pelvis compared with a white woman. The baby's head is however proportionately smaller.

With the present facilities obstetrical teachings in the Philippines have so improved that the fourth and fifth year medical student sees 42 cases of labor individually, some of which he delivers under supervision.

D. H. BROWN.

Cullen, T. S.: The Relation of Obstetrics, Gynecology, and Abdominal Surgery to the Public Welfare. *J. Am. M. Ass.*, 1916, lxxi, 722.

With the rapid development in these three branches, new problems have arisen and it may be well to consider briefly the relation they should bear to one another.

Obstetrics. A thorough knowledge of this art is infinitely more important to the student than is a clear understanding of gynecology. The vast

majority of medical students after graduation attend obstetric cases. These young general practitioners, if living in a fair-sized town or city, may be able to consult with an obstetric expert when in trouble, but often the practitioner's time for temporizing is so limited that he must rely absolutely on his own initiative. The physician living in the small town or in the country must pilot his patient through the dangerous shoals, relying entirely on the knowledge he has obtained from his former teachers, coupled with a gossily supply of common "horse-sense." Gynecologic cases rarely call for such speedy treatment. If the general practitioner is uncertain as to his diagnosis and does not know just what to do, he can as a rule temporize for a day or two and in the meantime have a consultation with a gynecologist. Furthermore, most of the gynecologic patients are well enough to journey to the city to see the gynecologist at his office or at the hospital. In obstetric cases the vast majority of physicians are obliged to take full charge of the case irrespective of its gravity; hence the absolute necessity of turning out graduates of medicine thoroughly grounded in the theory and practice of obstetrics.

Gynecology and abdominal surgery. The greater part of gynecology deals with the surgery of the lower abdomen. Sometimes the operation is confined entirely to an exploration of the abdomen, but frequently, as in prolapsus cases, in order that a satisfactory result may be obtained it is necessary to carry out some vaginal operation in connection with that in the pelvis. Where large tumors exist, the confines of the pelvis are temporarily carried far up into the abdomen, occasionally as high as the liver, and now and then the intestines are densely adherent and may require resection.

Every man who aims to make abdominal surgery his lifework should have a thorough training in general medicine. He will then know that pain in the right iliac fossa does not always mean appendicitis. He will know that occasionally this soreness is present in an early stage of typhoid fever. He will remember that there is such a thing as lead colic and that in children severe abdominal pain may be the precursor of pneumonia. A thorough knowledge of this broad and fundamental branch of medicine will save him from many pitfalls.

In addition to his course in general pathology, he should have an extensive knowledge of the pathology of all the abdominal structures. The abdominal surgeon of the future must be well-grounded in pathology; two years in the necropsy room would be of inestimable value to him. He should then pay particular attention to the bacterial flora associated

with the various abdominal lesions. After he has finished his apprenticeship he should become an assistant of an abdominal surgeon. Here he will not only learn the various operative procedures and perfect himself in them, but he will also become experienced in the preparatory and after-treatment of patients. The after-treatment, by the way, is of great importance, the post-operative journey often being rough and tempestuous, or relatively smooth, according to the manner in which the assistant handles the case. After several years spent in this way, the assistant is thoroughly competent to start out on his career. The surgery of the United States has made wonderful strides during the last decade, and we must prepare ourselves to become the graduate school of the world.

1. Obstetrics must be made more attractive so that those entering this branch will not be tempted to leave it for less laborious fields.

2. Any surgeon opening the abdomen should be capable of performing any abdominal operation that may be necessary. In other words, gynecology and abdominal surgery logically belong together.

3. This re-alignment of abdominal surgery is absolutely necessary if the maximum amount of good for the patient is to be accomplished.

EDWARD L. CORSELL.

Malsbary, G. E.: Marriage. *Am. J. Obs.*, N. Y., 1916, LXIII, 44.

After discussing this important subject the author draws the following conclusions:

1. Those contemplating matrimony should be encouraged to seek the advice of their physician.

2. The advice of the physician concerning a proposed marriage should be given only after a scientific study of the proposed union, and as careful examination and deliberation should be accorded as in a major operation.

3. It is only by such conduct that the profession can hold the confidence of the people and maintain the right to be consulted in such matters.

4. No application for advice regarding matrimony or allied matters should be taken otherwise than seriously.

5. The eugenic movement, though worthy in spirit, must ultimately fail unless it is supported and guided by scientific and medical men.

6. This paper though necessarily far from complete, shows there is a remarkable absence of the "rule of thumbs," that practically every case has to be decided on its merits, and that usually an intelligent opinion can be given only after examination and mature deliberation.

C. H. DAVIS.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Cabot, H.: Errors in Diagnosis of Renal and Ureteral Calculus. *Internat. J. Surg.*, 1916, 1:127, 22.

In a study of 153 cases of stone in the kidney and ureters, it was noted that 26 abdominal operations had been performed without relief of symptoms, which were clearly due to the overlooked calculus in the kidney or ureter, the appendix being the most frequent offender, followed in order of relative frequency by "exploratory laparotomy" and fixation of movable kidneys. The crowning iniquity was suprapubic cystostomy on a normal bladder for a stone situated a few inches away.

In all of this group of cases the pain was never such as to suggest stone in the kidney, from which it is seen that pain as an important evidence of stone is apt to be highly misleading.

In 150 cases in which the urine was carefully examined on more than one occasion, there were 21, or 14 per cent, in which it was entirely normal. It further appears that the probability of normal urine is much greater with stone in the ureter than with stone in the kidney. Thus of the 21 cases of normal urine, 14 were of stone in the ureter, while 6 were of stone in the kidney.

The author lays down the following rules as of aid in avoiding errors in diagnosis:

1. In all cases of abdominal pain of a recurring or abdominal type, in cases of backache, lumbar, or sacro-iliac strain, or lumbago, careful and repeated examination of sedimented urine, as well as the taking of X-ray plates, should precede positive diagnosis.

2. The possibility of error in the judgment of X-ray plates should be excluded by the use of the ureteral catheter, stereoscopic plates, injected radiograph, or the wax-tipped catheter.

3. Where the symptoms suggest ureteral calculus and a doubtful shadow appears, if the ureter cannot be satisfactorily catheterized, the decision for or against operation must be made upon the apparent gravity of the symptoms.

4. Where all other methods fail, the wax-tipped catheter is probably the most unerring guide, except where the stone lies out of reach in a dilated calyx.

H. W. FLEISCHNER.

Paschen, R.: The Ultimate Result of Operation for Grawitz' Tumor (Das Schicksal der wegen Grawitz-Tumore Operierten). *Arch. f. klin. Chir.*, 1912, 179: 213.

There is some question among pathological anatomists as to whether these tumors develop from abnor-

rant suprarenal tissue or from kidney tissue, and as the author does not feel competent to decide it he does not use the usual name, hypernephroma, but calls them Grawitz' tumors, as they were first described by Grawitz. He has collected from the literature reports of 768 cases that have been operated upon, the statistics showing deaths from operation 31, or 10.03 per cent; alive and well after three years 46, or 17.17 per cent. No information as to late results could be obtained in 22, or 8.21 per cent. Fifty-four cases have been operated upon in Paschen's own service at the Hamburg Hospital. Of this series, 6 or 11.11 per cent, died from the operation, while 19, or 35.19 per cent, are alive and well after three years. Over a third of the patients therefore are alive and well after three years.

Paschen has found that the results are much better if operation is done early; therefore he advises exploratory incision as soon as hematuria has appeared. If other causes for it such as stone, hemorrhagic nephritis, etc., can be excluded, even if palpation or roentgen examination do not reveal any tumor.

The tumors appear at all ages, from childhood to over seventy years, but the greatest number occur in the decade between fifty and sixty. He gives the histories of his 54 cases and a bibliography of the subject.

A. Goss.

BLADDER, URETHRA, AND PENIS

Braasch, W. F.: Significance of Vesical Symptoms in the Diagnosis of Renal Conditions. *Internat. J. Surg.*, 1916, XXVIII, 412.

The author reviews the common renal diseases which most frequently cause vesical symptoms and also discusses the extravescical causes.

The renal conditions which might produce vesical symptoms are: (1) tuberculosis, (2) pyelonephritis, and (3) lithiasis.

The author states that although vesical symptoms usually predominate in renal tuberculosis the fact has not obtained general recognition. In his experience 90 per cent of patients having renal tuberculosis have vesical symptoms extending over a period of 6 months; 50 per cent have symptoms for more than a year.

Diffuse infection in the renal parenchyma and pelvis with organisms other than tubercle bacilli (or pyelonephritis) causes a variable degree of infection of the bladder. This is usually less severe than in tuberculosis; occasionally, however, it may be so severe that the differential diagnosis is impossible. On the other hand, patients may have general infection of the kidney without vesical in-

involvement. Localizing symptoms referred to the kidney occur less often with pyelonephritis than with tuberculosis.

The fact is emphasized that no cases of so-called cystitis should be regarded as such until renal infection has been excluded. The treatment of these cases by various internal medication and by pelvic operations is condemned until a careful investigation has been made to rule out the presence of an etiologic renal infection. The author believes that the simplest way to establish the diagnosis of these cases is by ureteral catheterization and the only way to exclude renal infection is by bacteriological examination of the catheterized urine. He regards the pyelogram and the functional tests, especially phenolsulphonphthalein, as of corroboratory and differential value.

Irritability of the bladder and frequency of urination may be the only symptoms with urinary obstruction due to stone in the kidney or ureter. The author states that the absence of vesical symptoms coincident with pain should be a factor in exclusion in the interpretation of a doubtful renal or ureteral shadow. Vesical irritation is persistent when the stone is lodged in the vesical portion of the ureter. In some cases of stone the radiation of pain may be largely referred to the area of the bladder.

The author thinks that cystitis may be present without renal infection and has observed a number of cases which failed to show evidence of renal involvement. Bladder neuroses are usually accompanied by other evidences of neuroses and the bladder symptoms seem to be a part of a syndrome.

The author states that in the differential diagnosis of the various causes of irritability of the bladder, although the adjacent extravescical conditions have to be considered, the importance of their relation to bladder symptoms has been exaggerated. He classifies these causes as due to: (1) pressure of a tumor; (2) mechanical interference; (3) malignant involvement; (4) direct extension of an adjacent inflammatory process.

Although the pressure of an extravescical tumor may occasionally be the cause of vesical irritability, it is surprising how small a proportion of uterine tumors give bladder symptoms.

Mechanical obstruction to the urinary outflow as the result of uterine displacement in an otherwise normal uterus is not common in the author's experience. Large tumors of this organ and the adnexa are occasionally situated so as to cause mechanical obstruction. In the author's experience cystocele is the cause of urinary retention only occasionally.

Involvement of the bladder by malignant conditions in the pelvic organs does not occur frequently with operable cases. Cancer of the rectum involves the bladder more frequently than cancer of the uterus.

When vesical symptoms result from bladder involvement secondary to inflammatory conditions in the female pelvis, evidence of the vesical lesion may always be shown by cystoscopic examination.

The author concludes by urging a careful consideration of all of the possible causes of vesical symptoms, including renal infections, ascending infections, local infections, ulceration and neurosis, and that plastic operations on the pelvic organs be resorted to in exceptional instances only.

G. J. THOMAS

Kretschmer, H. L.: Cystinuria and Cystin Stones; a Report of a New Family of Cystinurias.
Urol. & Cutan. Rev., 1916, **21**, 1.

Kretschmer reports two cases of pure cystin vesical calculi in nine-year-old twin brothers, two of whose sisters had cystin crystalluria, a brother sulphur in the urine, while the mother's urine was negative and the father's urine not examined.

In the first case symptoms had begun three years prior to examination with difficult urination and later incontinence. Still later an attack of retention developed, when catheterization gave 12 ounces of normal urine. Cystoscopy revealed three stones the size of hazelnuts and no cystitis. Reflexes were normal.

In the second case similar symptoms were noted with a colon bacillus cystitis superimposed; there was one large stone in the bladder and in addition there were septic symptoms; patellar reflexes were not obtainable; the penis remained semierect and one arm was involved by an old infantile paralysis.

The treatment consisting in litholapaxy was followed by recovery in both cases.

In both cases the stones gave good X-ray pictures, in contradiction to the usual idea that cystin stones do not cast X-ray shadows.

A review of the literature shows that cystin stones are usually pure; are a family affliction, due to some metabolic error preventing complete protein oxidation, or to a sulphur-removing defect; that removal of the stone does not always relieve cystinuria; and that all treatment is more or less unsatisfactory.

G. S. PETERSEN

Hamer, H. G.: Limitations of High-frequency Treatment of Papilloma of the Bladder.
Lancet Clin., 1915, **CV**, 43.

Hamer's reports show that recurrences after the use of the high-frequency current are considerably less than after operation for papilloma of the bladder. He emphasizes the fact that no one is clinically able to make a diagnosis of malignancy definitely in these tumors, and that all of them should be regarded as malignant until microscopically proved benign. The clinical signs of malignancy of bladder tumors must be classified anew for this line of treatment. The failure to respond to the high-frequency current indicates clinical malignancy.

Twenty-three cases are reported. There was recurrence or secondary growth in one case of malignancy of the bladder after twenty-six applications of the high-frequency current. This case had been previously operated upon radically after removal of

the primary tumor. There was recurrence in 2 cases of benign tumor after nine and twelve treatments, respectively. Of 15 cases 8 are well after four months to two years. One died of other causes. Six are still under treatment. The maximum number of treatments was forty-two. Both the Oudin and D'Arsenval currents were employed in treating these cases. Applications of the high-frequency current in these cases of carcinoma showed some haemostatic effect and slight reduction in the size of the tumor, or, on the other hand, marked reduction in size, followed by rapid growth uncontrolled by burning. In one case, the treatment seemed to cause more rapid extension.

The conclusions reached are:

1. High-frequency cauterization is an important addition to our means of attacking vesical papillomata of the non-infiltrating type.

2. All benign papillomata should be treated primarily with the high-frequency current in view of the high percentage of recurrences following open operation (50 per cent) and the high mortality (10 per cent).

3. In cases in which suprapubic operations have been done recurrences should be looked for, and if present, treated by fulguration upon their first appearance.

4. In dealing with papilloma involving the vesical orifice and prostatic urethra, perineal cystostomy with removal of as much of the tumor as possible, and applications of the high-frequency current to the remaining growth seems a rational procedure.

J. EISENSTADT.

Morton, H. H.: Stricture of the Urethra. *Med. Times*, 1915, xlii, 382.

The first case was neglected stricture of the urethra, in which two previous operations had been performed but no sounds were passed and there was a reconstruction of the stricture. A third operation was performed. The urethra was opened in the perineum. The proximal end of the guide was drawn out through the wound and Raul's tunneled knife threaded over it and pushed into the bladder, dividing the stricture bands on the floor. A gorget was introduced and the bands freely divided with a blunt blade. The interior stricture was divided by internal urethrotomy. The perineal urethra was partly closed by suture, and a perineal drainage tube introduced into the bladder. The after-treatment consisted in leaving the tube in from four days to a week and then taking it out. The patient will be required to use sounds in order to keep the canal open as long as he lives.

The second case was a traumatic stricture. Nine previous operations had been performed; passage of sounds had been neglected; reconstruction followed. The case was treated by continuous dilatation. The patient was a boy of 16. The author first attempted to treat him by tunneled sounds, but after a month gave it up. The nine previous operations made it inadvisable to do a perineal

urethrotomy and it was decided to treat the case by continuous dilatation. The method of procedure was the passing of a small instrument, like a filiform guide, through the urethra into the bladder, and leaving it there for twenty-four hours. The stricture widened around the guide and after twenty-four hours the guide could be withdrawn and a little larger instrument introduced. After twenty-four hours the stricture widened a little more and this instrument was taken out and a still larger one introduced. Gradually flexible bulbous bougies were introduced from a No. 12 bougie up to a No. 26. Continuous dilatation is an old plan of treatment and antedates cutting of the stricture by many years. It has its own particular place and was very useful in this case.

H. A. MORGAN.

McGavin, L.: Cancer of the Penis. *Clin. J.*, 1916, xlv, 21.

Only 1 to 3 per cent of all cancers are found on the penis, a fact doubtless due to the isolated position of the organ, with the consequent advantage of constant supervision and earlier treatment. The disease shows a predilection for the prepuce, 70 per cent arising there, with phimosis present in nearly every case. In this connection, the author avers that the prepuce has served its purpose in the early history of the race, and is no longer necessary. As a result of the Mosaic law governing circumcision, cancer of the penis has a lower percentage among the Jews than among uncircumcised races. This fact strengthens the opinion that circumcision should be practiced more frequently than it is.

Like all other varieties, cancer of the penis is largely favored by chronic irritation and the production of cicatrices. Prophylactic measures suggested are: avoidance of venereal contamination, personal cleanliness, removal of warts, early treatment of any cause of irritation, and most important of all, circumcision.

Treatment by means of X-ray, radium, etc., has proved thoroughly disappointing. The only cure is early and drastic operation. There is a choice of two operative measures: amputation and complete extirpation. The former may yield permanent good results if done very early and there be no glandular involvement. Experience, however, has shown that frequency of recurrence is in inverse ratio to the severity of the operation. Complete extirpation, therefore, is the operation of choice, for in spite of its severity it yields excellent results. The author does not advise a removal of the testes. In elderly men there is little object in so doing, and very grave danger of consequent senile dementia. In younger men, the risk is less, but castration should be done only in those rare cases where the patient himself demands it. Even in that event, the two organs should not be removed simultaneously, but at least a month should intervene between the two operations.

The author's technique is given in considerable detail. In brief it is as follows: Turn out the whole

mass of glands from above and externally toward the pubes, and leave it attached by the pedicle containing the lymphatic tract. Make a circular incision around the root of the penis. Split the scrotum to within two inches of the anus, and hold the two halves apart, disclosing the whole operative area. Free the penis with its lymphatic tracts and glands from the pubes by dividing its suspensory ligament, and strip the corpora cavernosa back from the ischium, where they are divided with scissors or scalpel; then detach the whole organ.

In so extensive and deep a wound, the author says that suppuration is the rule, and such an operation calls for particular post-operative care. Little value is placed on the use of vaccines for infection. Suggestions are made for the treatment of all probable complicating after-results. W. E. Lower.

GENITAL ORGANS

Lichtenstern, R.: Transplantation of Testicle into Abdominal Muscles (*Transplantation eines Testikels in die Bauchmuskulatur*). *Med. Klin., Berl.*, 1916, xli, 27.

At the Medical Society of Vienna the author demonstrated a 28-year-old soldier who had had a gunshot wound of the urethra and testicles so that the latter had to be removed. Two weeks later sexual desire had disappeared.

The fat tissue about his neck increased and his beard became thinner. The author took the testicle of a patient who was being operated upon for inguinal hernia, cut it in two parts and sutured the parts into the abdominal muscles on each side of the midline. On the sixth day libido and erection reappeared, and three weeks after the operation were still active. His neck had become normal and the beard had grown thicker.

Tandler said he considered this an important experiment as showing the effect of the sexual glands on libido and secondary sexual characters. He believes, however, that the testicle will share the fate of most implanted organs, that it will atrophy after a time. *Potentia coeundi* is dependent on the interstitial substance of the testicle. The testicles of cryptorchids are not capable of reproduction, but the interstitial substance is normal. Such implantations should be made as frequently as possible.

LATZKO said ovaries had been implanted in women with excellent, but temporary, results; after two or three years the effect disappears because the ovary atrophies. In this case of transplantation of the testicle he thinks the result will be temporary also.

A. Goss.

McKeon, F. H.: Report of a Case of Periprostatic Abscess of Tuberculous Origin. *N. Mex. M. J.*, 1916, xv, 156.

In April, 1915, the patient began to complain of pain in the lower lumbar and suprapubic regions, and adductor region of both thighs, the pains grow-

ing gradually worse until the patient was unable to walk. He had two attacks of gonorrhea, one in 1905, complicated by arthritis of the left knee, the second in 1909, which was accompanied by orchitis. The right lobe of the prostate was enlarged and nodular. Cultures showed staphylococci and a few streptococci.

A psoas abscess developed, aspiration showed tubercle bacilli. Polyuria, dysuria, and tenesmus supervened. The cavity was found to lead toward the true pelvis and prostate. Under general anesthesia a suprapubic incision proved the condition to be an abscess of the right lobe of the prostate. After resection of the right vas deferens the patient recovered. H. A. Kraus.

Randall, A.: Prostatism Sans Prostate. *N. Y. M. J.*, 1915, cli, 1123, 1177.

The author calls attention to a condition of the vesical neck simulating hypertrophy of the prostate in which the prostate is not enlarged, the symptoms of which are due to median bar formation. The early history of the first observation on this subject is given in detail. The anatomy and physiology, the etiology and the symptomatology are thoroughly discussed. Drawings illustrate the normal and contracted vesical neck, the normal anatomy of the vesical orifice, and the bladder musculature.

The author believes that the medical profession has learned to recognize the symptoms of the third stage of prostatism, but has not learned that this classical picture may be due to other conditions than hypertrophy of the prostate.

Mercier is generally given the credit for first describing this condition, but the honor belongs to G. J. Guthrie, an Englishman who lectured upon and described this condition in 1830. His conclusions are: (1) that the elastic structures at the neck of the bladder may be diseased without necessary connection with the prostatic gland; (2) that the prostate may be diseased without any necessary connection with the elastic structures.

The author reviews the anatomy of the bladder, prostate, and posterior urethra, and gives the position of the sphincters and their relation to the musculature of the bladder and the urethra and prostate. The act of micturition is described as a simultaneous association of voluntary and involuntary muscular action, as likewise one of inhibition and stimulation.

Guthrie defines two distinct types of obstructive bars: (1) An unnatural elevation of certain fibrous structures which underlie the mucous membrane at the posterior or vesical limit of the urethra, but which is unaccompanied by and unconnected with any enlargement of the prostate. The normal elasticity is lost and an unyielding structure forms the barrier which is due to a localized disease. (2) Intravesical enlargement of one lobe of the prostate so affects the orifice that the bar formed at the neck of the bladder consists of mucous membrane elevated and drawn tightly across the under part

of the opening in consequence of its connection with the prostate through the adjacent parts. In this type if the prostate could be removed the mucous membrane would fall back in its proper place.

Civiale attributed the cause of non-prostatic obstruction to (1) an abnormal development; (2) inflammation associated with an involuntary contraction, either temporary or permanent; or (3) rheumatism. He also thinks that in these cases instead of an hypertrophy of the prostate an atrophy is more likely to be found.

Merz gives two types of bar formation: One is due to repeated spasms of the muscle fibers of the internal vesical sphincter, until after long continued and oft repeated attacks these fibers become permanently contracted so that as a consequence a bar or barrier is formed by the posterior lip of the vesical orifice. This is termed the muscular type and is due to an exaltant of muscular activity. The second is due to hypertrophy of glandular tissue of the median portion of the prostate. This is termed the "prostatic" variety.

The French observers including Guyon did not accept Guthrie's idea, but were of the opinion that the cause of the retention could be found in the bladder wall itself, that hypertrophy of the prostate was but a concomitant factor and not the pathological change responsible for the obstruction.

In 1897 Eugene Fuller stated that in his opinion the cause was situated at the vesical neck and the result of functional contracture or spasm secondary to some settled disorder of the genito-urinary tract and compared it to the action of the sternolebdomastoid muscle in torticollis.

In 1905 C. H. Chetwood came to the conclusion after a study of 36 cases that there was not an hypertrophy of the muscular elements of the internal sphincter but a fibroid stenosis of the orifice.

Civiale first pointed out that at operation the prostate was smaller than normal. This led many German observers to attribute the condition to a primary atrophy of the gland. Some think the change a congenital hypoplasia, while others think it is due to atrophy secondary to inflammation. The advocates of the atrophic theory of obstruction have tabulated the conditions under which an atrophy of the prostate may be expected as: (1) atrophy of inflammation, (2) atrophy of cachexia, (3) atrophy of compression, (4) atrophy of castration, (5) senile atrophy, (6) congenital atrophy, (7) traumatic atrophy, (8) atrophy following X-ray exposure.

Another theory offered as a cause of vesical insufficiency is the loss of the Hensen-Hensen reflex. Althaus and Noyes brought this out before the First International Congress of Urology.

The symptoms develop gradually as in hypertrophy of the prostate and as the result of the bar and not because of it, as in hypertrophy. The condition occurs at a younger age than prostatitis, many cases occurring below 30 years. Some cases

are of congenital origin and do not form symptoms until adult life. The author thinks that the degree of amount of obstruction when of congenital origin may vary, as may also the age at which symptoms become obvious.

Delay and difficulty at the outset of micturition is one of the early symptoms. There is diminution in the force of the stream; the trajectory is decreased, the size lessened, and considerable straining is necessary to initiate, and finally dribbling results.

There may be burning at the neck of the bladder though not a distressing pain. Pain referred to the lumbar region, the hips, perineum, or thighs is present in about 50 per cent of cases.

Residual urine is at first small in amount and is retained just back of the trigone where as it increases it causes pouching of the bladder and possibly diverticulation. The amount is usually less than 100 ccm. Incontinence of overflow is occasionally seen, but patients usually come for treatment before this amount has been retained. Residual urine is a most important sign from which all other symptoms develop.

The association of a Neisserian infection is hard to confirm. Previous infection in the prostate probably leads to changes which are obstructive in character. When residual urine is carried there is constant danger of infection, and it becomes a certainty if a catheter is constantly used. Everything is conducive to perpetuation of infection in these cases. Cystitis is not common, but infection causes urgency; frequency is more marked and urination painful. It may cause contiguous or metastatic infections elsewhere in the body.

Frequency is an early symptom because of irritation at the vesical neck, from obstruction, from congestion, and from the constant infection.

Some patients come for advice for renal insufficiency only, not appreciating the nocturnal frequency and urgency which had been present for some time. The physician who has a patient with the symptoms of vesical neck obstruction should look out for renal insufficiency. Failure of the kidneys in these cases is due to obstruction. Holtz-Boyer has shown experimentally that in chronic interstitial nephritis, it is the "concentrating power" of the kidney that suffers.

The continuous presence of residual urine and infected urine is a constant invitation to precipitation of urinary salts. The author thinks that in many cases of vesical calculus the cause of stone formation is overlooked.

The view has been sustained since the writings of English that in the majority of cases the primary change in prostatism sans prostate consisted of an atrophic shrinkage of the prostate gland, and that the obstruction to the vesical orifice was due to a secondary distortion from such changes, plus a concomitant sclerosis of the internal vesical sphincter.

These obstructive bars thus formed may be divided into three groups as follows:

1. *Valvula mucosa*, appearing as a thin, uniform reduplication of the mucous membrane, arising from the posterior lip of the orifice.

2. *Valvula muscularis*, formed of dense, thick tissue, with smooth surfaces, covered with thin mucous membrane, and consisting chiefly of sphincter muscle tissue. This is considered to be the most prevalent type of bar formation.

3. *Valvula musculoglandularis*, due in reality to an underlying hypertrophy of the glandular tissue of the middle lobe of the prostate.

A fourth type has also been described, which is a pure muscular hypertrophy, forming a circular muscular stricture surrounding the entire urethral opening.

After reviewing the various causes of atrophy of the prostate, Randall says that the only types which, on account of the frequency of their occurrence, demand attention are congenital atrophy, inflammatory atrophy, and senile atrophy. It is still an open question whether even this simple classification allows of differentiation microscopically, and probably it will stand as one of clinical importance only. The ultimate pathological picture is a destruction of the normal gland elements, a connective-tissue infiltration, and a general contracture or shrinkage of the entire organ.

Randall attributes to Young the first comprehensive study of the actual obstructive tissue at the orifice, comprising the conclusions from over 100 cases in which the obstruction was excised by means of a special instrument. It was found that the most common change was the occurrence of a comparatively newly formed connective-tissue layer immediately beneath the mucous membrane, forming a firm fibrous ring, associated with elevation of the median portion of the prostate. There was no underlying prostatitis and no connective-tissue infiltration of the sphincter muscle or of the gland tissue. The etiology of this type is the most difficult to determine.

The second group of cases as classified by Young is of almost equal frequency. In these specimens there was found, in addition to a submucous connective-tissue layer, a chronic inflammatory condition in the glandular tissue, often with marked periacinous infiltration, which occasionally extended into the muscle. This type is undoubtedly the one following a period of chronic prostatitis.

The pathology of the third and last group of cases bears out the original description of Home in 1811, and was verified by Lowley in 1912. The latter proved the presence of middle-lobe tubules in 97 out of 98 specimens. Microscopically this third group shows typical hypertrophic glandular tissue, often associated with an inflammatory infiltration in and around the acini, which, if of sufficient duration, is accompanied by connective-tissue changes as in the second group. This hypertrophic glandular tissue is not from the lateral lobes, but is a proliferation of either (1) the suburethral group of gland acini lying beneath the mucous membrane of the

vesical orifice inside the internal sphincter, and usually referred to as Alliaran's glands, or (2) the sub-trigonal group of glands lying beneath the mucous membrane of the trigone, and originally described by Home.

The frequency with which this type of bar obstruction occurs is remarkably high, as shown by recent observations. The combined figures show that in about one in every eight patients suffering from symptoms of prostatism, there is not what has heretofore been universally considered to be hypertrophy of the prostate, but rather an atrophic gland with the obstruction due to the formation of a median bar.

The diagnosis of these conditions is by no means easy and may exhaust every means at the command of the surgeon. Catheter examination shows more or less residual urine, but it must be remembered that the amount found is not of necessity an index of the severity of the obstruction, and may be out of all proportion to its cause. It may also be found that the obstruction at the bladder neck requires the use of a special type of catheter, particularly the *coudé* or *bicoudé*. Digital examination of the rectum will exclude certain prostatic changes, notably cancer and simple hypertrophy. Cystoscopy will generally show not only the thickening of the posterior lip of the vesical orifice, but also the evidence of obstruction offered by trabeculation of the bladder wall.

From his own experience and from a study of the results obtained by others in these conditions, Randall says when the proper diagnosis is understood and its treatment correctly directed, the prognosis may be considered decidedly more favorable than in prostatic hypertrophy. In summarizing treatment, Randall's views are as follows:

The indications governing treatment clearly demand the removal of the obstruction. It has been repeatedly demonstrated that excision of the obstructing portion at the vesical orifice will allow complete evacuation of the bladder. To obtain this result a total prostatectomy is not warranted, both because of the age of the patient, which is often within the procreative period of life, but also because of the magnitude of the operative procedure. The remaining methods that may be advocated divide themselves into three classes:

1. The excision of the obstructing bar by means of Young's urethrosopic median bar excisor. In the hands of the originator of this instrument, this method has given brilliant results in the largest series of cases yet studied, and well deserves further and more extensive use. The danger from uncontrollable hemorrhage has to be considered and offers the one objection to its use, though Young himself has never experienced it.

2. The obstructing bar may be attacked and severed by means of the galvanocautery incision, as advocated by Chetwood, or by using the Goldschmidt urethroscope, as recommended by certain Continental urologists. The latter method is sup-

posed to have the advantage over the former of not being complicated by the danger of hemorrhage, and when thoroughly performed it should lead to a prompt cure of the urinary difficulty.

3. The third method, which at present seems likely to be the one of choice in the future, can hardly be classed as either an excision or an incision of the bar, but rather a destruction of the obstructing portion by means of the high frequency fulgurating current. This is performed by the repeated application of the spark to the desired portion of the vesical orifice through the ordinary catheterizing cystoscope. Although this latter method is of decidedly recent development, so much so that statistics are as yet not forthcoming, it gives promise of superseding a more dangerous and a more radical operation.

G. J. THOMAS.

Spalding, C. B.: Prostatectomy. *Urol. & Cutan. Rev.*, 1916, IX, 20.

This paper deals with the physiological hypertrophied prostate which has been neglected, and the author therefore favors the two-stage operation. Under local anesthesia suprapubic cystotomy is performed, and perfect bladder drainage established. This is preferable to frequent catheterization and irrigations. Immediate relief is obtained, and the shock is minimized. The reconstruction is then started.

The preparatory treatment varies between two and six weeks. The urinary output is carefully watched and bowel elimination established. These are the two most important objects and as they progress favorably so does the general physical condition. The second stage is then performed.

Chloroform is used as an anesthetic in the very old, while gas-oxygen is more successful in patients with bronchial irritation. The previous incision is enlarged to admit two fingers. With a metal sound in the urethra for a guide and the left index-finger in the rectum, the gland is enucleated. Drainage is established by a catheter so levered that the openings are in the prostatic urethra, while one end extends through the wound and the other through the penile urethra. This is supplemented during the first twenty-four hours with a "standpipe-tube," to which is attached a siphon. These tubes are kept free from clots. Later when the wound has closed around the catheter, it is removed and an ordinary retention catheter used. C. D. PICKRELL.

MISCELLANEOUS

Curtis, A. H.: Laboratory Diagnosis of Chronic Infections of the Urinary Tract in Women. *Internat. J. Surg.*, 1916, VIII, 12.

Chronic infections of the urinary tract can be best diagnosed by one who is actively engaged in clinical work, including cystoscopy and laboratory study. Careful correlation of clinical findings and laboratory methods, with extensive modifications in cultural technique to meet individual cases, is essential.

The source of even small amounts of pus in the urine should be investigated; the place of its formation should be definitely localized through the assistance of urethral catheterization.

Persistent pyuria in the absence of a gross bladder lesion is almost invariably due to kidney disease.

In those frequent cases with bladder irritability which yield clear, bacteria-free urine, cultures from the traumatized urethral canal or from the introduction of a probe into Skene's ducts may demonstrate the cause of infection. When bacteria are widely scattered or grow with difficulty, a mixture of the urinary sediment with blood, followed by the making of a large number of ascites-blood-agar tubes, of high dilution, results in conditions favorable for the development and isolation of the bacteria present.

Experience teaches that the chief lesions in urinary tuberculosis are usually renal. In obscure cases laboratory diagnosis is facilitated by the use of potassium iodide, tuberculin, kidney massage, limitation of liquids, repeated examinations of fresh specimens after high power centrifugation, Peroff cultures, and injection of a series of medium-sized guinea pigs.

There is seemingly a tendency to lay undue stress on functional urinary tests at the expense of careful routine examination. H. W. PLAGEMEYER.

Larkin, J. H., and Levy, I. J.: A Pathological Study of Syphilitic Aortitis and Its Serology. *J. Exp. Med.*, 1916, XXII, 25.

The authors recognize the fact that the Wassermann reaction as a diagnostic factor in syphilis holds a unique position in clinical medicine. They recognize, however, that there is a wide difference of opinion in regard to the infallibility of this method of diagnosis. As in all other problems in medicine it is the work of the pathologist to demonstrate the probable focus of infection in an individual with a positive Wassermann reaction, in whom there is no clinical evidence of syphilis. With this in view it occurred to the authors to check the serological diagnosis on the autopsy table; that is, to find some definite pathological explanation for this type of reaction in so-called latent syphilis. Since syphilis primarily attacks the blood-vessels—in fact, it is regarded as a disease the manifold pathological changes of which have their origin in diseased blood-vessels—they turned their attention first to the aorta.

Approximately 30 cases were examined, and the results were summarized as follows:

Syphilitic aortitis is a productive inflammatory process, the earliest and most constant feature of which is a perivascular round-cell infiltration in the adventitia.

The typical gross picture of luetic aortitis is often obscured by a superimposed, diffuse atherosclerosis. In the early cases the aorta appears fairly normal, presenting only the characteristic histological changes.

A pure aortic insufficient valve, with the exception of an infectious endocarditis, is always luetic.

Cardiac hypertrophy is not a complication of luetic aortitis. When present it is usually associated with a nephritis.

The demonstration of spirochetes pallida, even in advanced specimens of syphilitic aortas, is doubtful.

An antigen prepared from the alcoholic extract of guinea-pig heart with the original Wassermann technique should be preferred in diagnosing luetic aortitis.

Positive complement fixations in patients suffering from syphilis for a period of about fifteen years or longer suggest the probability, at least, of histological luetic changes in the aorta in 80 to 90 per cent of the cases. Of these 60 per cent die from aortitis. About 94 per cent of patients suffering with aortitis give positive Wassermann reactions.

GEORGE E. BILBY.

Haines, T. H.: The Incidence of Syphilis Among Juvenile Delinquents; Its Relation to Mental Status. *J. Am. M. Ass.*, 1916, lvi, 102.

This article is based upon hundreds of Wassermann tests. The author's conclusions are:

1. No larger percentage of those yielding positive Wassermann reactions are defective in intelligence than in the general population of reform schools.
2. There was complete absence of evidence of the signs of congenital syphilis in 30 positive cases.
3. Cases of positive Wassermann with sister or father yielding a negative Wassermann point to an individual infection.
4. In a feeble-minded family of criminal tendency, and especially sexual offenders, father and daughter yielded negative serums.
5. The court charges against the girls in the majority of the cases, and the extent of sexual immorality, allow abundant opportunity for infection.
6. The absence of evidence of syphilis in the personal history and medical certificates can be given no weight, either for or against individual infection.
7. The absence or exaggeration of deep reflexes without difference in the two sides of the body, and without disturbance of the light reflex of the pupil, indicates that if these signs are due to syphilis of the nervous system, that they are early signs and so far tend toward evidence of individual infection.

H. A. KRAUS.

Englander, S.: Essential Hematuria. *Uro. & Cuban. Rev.*, 1916, xi, 16.

In an interesting review of the literature the author has obtained many different opinions concerning essential hematuria. Chronic passive congestion, tuberculosis, and the various lesions in nephritis are quoted as the causes of many of the symptomless cases of hematuria. Englander believes in essential hematuria and makes the diagnosis by careful exclusion. Roentgenography in stone cases, the examination of the eye-ground in nephritis with scanty or no urinary findings, focal reactions or animal inoculation for tuberculosis in which the bacilli have not been demonstrated and collargol pictures for new-growths and necrotic areas in infections are all routine procedures. If hemorrhage is pathological the functional activity is decreased, while in essential hematuria the ptalein returns a normal output.

The treatment of hematuria depends upon the cause. If an operable case, the cause may be found which had not been localized during the examination. Harpster recorded a case caused by supernumerary arteries, which, when ligated, eliminated the hematuria. Edenbohl's stripping of the capsule in acute parenchymatous nephritis is usually sufficient. Mattress sutures usually stop the hemorrhage in glomerulonephritis.

C. D. PICKRELL.

Lewis, B., and Bartels, L.: Caudal Anæsthesia in Genito-urinary Surgery. *Lancet-Gin.*, 1916, cxv, 28.

Lewis and Bartels speak very enthusiastically about their experiences during the past six months with caudal anæsthesia in operations upon the perineum, urethra, and bladder. In their article they review the history of this method, describe the anatomy of the sacral region, and give in considerable detail their technique. The solution which they use differs from that described by Harris in that they omit chlorotone.

The failures have been few and have been due to causes which were avoided in later attempts. The danger of this method is almost nil, and it is far safer for old people or cases of cardiorenal disease or sepsis than are the general anæsthesias. Spinal anæsthesia they consider the most dangerous of all methods.

G. G. SMITH.

SURGERY OF THE EYE AND EAR

EYE

Mosher, H. P.: Operation for Draining the Lachrymal Sac and the Nasal Duct into the Unciform Fossa. *Laryngoscope*, 1913, LV, 739.

Mosher describes his technique as used successfully by him in three cases of dacryocystitis in which he desired to establish intranasal drainage of the tear sac and nasal duct. He states that the operation is an outgrowth of observations made while curving the anterior ethmoid cells, the nasofrontal duct, and the frontal sinus. Examinations of anatomic specimens following such work showed in most cases that the posterior half of the nasal duct was laid bare. This led to the thought that the duct could thus be approached and drained into the unciform fossa of the middle meatus.

The anesthesia may be entirely local or may be a combined local and general anesthetic. For convenience of description the operation is divided into six steps.

1. Removal of the anterior end of the middle turbinate. The punctum lachrymalis is dilated or preferably slit to admit a stiff probe which is carried through the canaliculus, the sac, and down the duct to the inferior meatus.

2. Incision through the mucoperiosteum along the posterior edge of the ascending process of the superior maxilla. This cut extends from the attachment of the middle turbinate downward, stopping at the upper border of the inferior turbinate. The second incision is carried from the lower limit of the vertical incision back along the upper border of the inferior turbinate for one-half inch and then from the top of the vertical incision a second horizontal incision is carried across the upper limit of the unciform fossa. The flap thus outlined is raised and tucked backward and downward and so exposes the unciform fossa.

3. During this time the stiff probe has been in the nasal duct. Now with a proper curette an opening is gained to the lachrymal cell and then is brought outward and forward against the posterior edge of the ascending process of the superior maxilla. The curette is kept facing forward. Care is used not to remove the unciform process on account of the proximity of the antrum.

4. The stiff probe is withdrawn and when its point has escaped from the upper rim of the inferior turbinate, pressure is made inward with its point. A break is thus made through the inner wall of the nasal duct, and into the unciform fossa. The point is then advanced into the cavity of the nose and then the probe is swung upward, thus laying open the inner wall of the nasal duct from the inferior tur-

binare upward into the sac leaving only two or three millimeters of sac wall not rent through.

5. The stiff probe is then re-introduced and the operator cures along the whole length of the posterior surface of the ascending process of the superior maxilla.

6. The probe is withdrawn and the nasal duct widened by biting off the anterior part of the inner wall of the duct which is composed of the ascending process of the superior maxillary bone.

A ligature carrier of special design is passed from the nose out through the slit or dilated punctum and armed with a ligature. The carrier is withdrawn and a piece of gauze is attached to the nasal end and drawn up into the nose, thus holding the flap that has already been replaced where it is desired to cover denuded bone. The end of the ligature coming from the punctum is fastened on the brow with adhesive plaster.

The after-treatment is the same as that following most nasal operations.

The author states that this operation is like all others in that one faces the danger of having a final narrowing or closure of the duct, but that this may be overcome by a reslitting of the duct.

J. S. CLARK

Duane, A.: Torticollis Relieved by Tenotomy of the Inferior Oblique. *Arch Ophth*, 1918, LV, 31.

Duane cites a case of head tilting due to the effort to avoid diplopia, and relief by tenotomy of the overfunctioning muscle of the secondarily deviating eye. He describes the technique of the operation and refers to several types of cases.

A girl aged 3 years and nine months had tilted her head to the right shoulder since the age of four months. Orthopedic apparatus and massage gave no relief. When the head was straightened by a brace the left eye deviated upward; on bandaging the left eye the head immediately became straight. When the head was tilted in the desired position there was about 10° of left hyperphoria; with the head straight there was more than 20° of left hyperphoria. The diagnosis was congenital insufficiency of the right superior rectus, fixation with this paretic eye, and sharp secondary deviation upward of the left (sound) eye. Tilting of the head brought the images more to a level. Duane did a complete tenotomy of the left inferior oblique at its origin, with the result that the head remained practically straight, only a few degrees of hyperphoria remaining.

There are two important indications for this operation: paralysis of the superior rectus (congenital or traumatic) with secondary deviation of

the inferior oblique of the opposite eye, and paralysis of the superior oblique with secondary deviation of the inferior oblique of the same eye. In such cases the individual may shut one eye, but this is tiresome; he may converge or diverge enough to separate the images so far that one is ignored; or he may tilt the head. The latter is the most likely occurrence. Duane advises incision at the intersection of the lower orbital margin with a perpendicular dropped from the supra-orbital notch, cutting through the orbital septum close to the margin, and keeping close to the floor of the orbit with the strabismus hook passed up and in close to the origin of the muscle.

EMORY HILL.

Smith, H.: Conjunctival Flaps in Cataract Operations. *Indian M. Gaz.*, 1916, li, 11.

The execution of the conjunctival flap is facilitated by the ballooning of the conjunctiva upon a solution of cocaine and adrenalin.

Stanculeanu's flap is made by a pericorneal incision of the conjunctiva of about half its circumference, diverging at either extremity sufficiently to allow the insertion of a suture, which when tied draws the distal lip of the conjunctival rent down over the upper border of the cornea. Its chief advantage over other flaps is claimed to be that it maintains by pressure close apposition of the sclerocorneal wound. Smith enumerates these disadvantages: the time required, adhesions of its border to the sclerocorneal wound resulting in serious complications, increased traumatism, and increase of the danger of loss of vitreous. It is, however, the best flap operation, since it allows the operator a fair chance to deal with complications.

The free border flap made by dissecting up a flap of conjunctiva at the upper limbus and carrying the sclerocorneal incision underneath its attached margin has been entirely discarded by the author for the following reasons: primary and secondary hemorrhage—obscuration of the operation field resulting in faultily placed incision, delayed healing, late infection, high astigmatism. The making of the flap as a part of the sclerocorneal incision is neither easy nor satisfactory.

Czermack's flap and modifications which consist essentially in a preliminary conjunctival incision through which the membrane is undermined to the limbus. Through this opening an incision is made, partially with the knife and partially with the scissors. These flaps do not permit the intracapsular operation as they do not give sufficient room. They are difficult to execute, are painful, and heal badly.

W. REEDEL.

Aubineau, E.: Embedding the Nasal Canal in the Treatment of Dacryocystitis (*L'effondrement du canal nasal dans la cure de la dacryocystitis*). *Arch. d'oph.*, 1916, xxxv, 33.

Suppuration of the lacrimal sac is a constant danger to the eye. It is therefore important to seek a rapid and radical treatment. The operation

now in use against dacryocystitis consists in either ablation of the sac or destruction of the sac. The author prefers destruction of the sac and has practiced that method for ten years, but this procedure is itself insufficient unless completed by the embedding of the nasal canal to provide an effective drainage through the nasal fossae. This latter systematic embedding characterizes his operative treatment.

The operation is divided into four parts: (1) opening the site of the sac; (2) curetting of the walls of the sac and the debris as well as the surrounding tissue; (3) seeking out the nasal canal; (4) embedding of the bony nasal canal which ought to penetrate into the nasal fossae, use of gauze tampons and light compress dressing.

A. Goss.

Allport, F.: State Legislation Concerning Ophthalmia Neonatorum. *Ophthalmol.*, 1916, xv, 256.

The author gives a comprehensive review of recent state laws with the following résumé of very important facts:

1. Ophthalmia neonatorum is responsible for 20 per cent of the blindness in the United States.
2. It costs \$400 per year to educate a blind child as compared to \$30 to educate a seeing child.
3. There are about 50 blind schools in the United States costing about \$2,000,000 to maintain.
4. Ophthalmia neonatorum costs \$7,000,000 yearly in the United States.
5. The use of the Credé method of prophylaxis would entirely eliminate ophthalmia neonatorum.

EMORY HILL.

Norris, E. J.: Tuberculosis in Its Relation to Eye Diseases. *Med. Fortnightly*, 1916, xlviii, 1.

After a discussion of tuberculosis in general, the author expresses a belief that there are tuberculous conditions in the eye other than the typical ones described. In support of this view he reports two cases.

The first case was persistent recurrent trachoma which was treated for more than a year by the usual methods with little permanent result. The cornea was extensively involved. Tuberculin treatment and systemic injections produced remarkable improvement.

The second case was a child of seven years with a phlyctenular ulcer of the cornea. Recurrences had occurred over a period of several months. The condition was cured and remained so after tuberculin treatment.

E. B. FOWLER.

Lister, A. E. J.: Injuries to the Eye Resulting from Accidents at Polo. *Indian M. Gaz.*, 1917, l, 437.

Lister reports two cases of injury to the globe by blunt force. The first case was the result of a blow by a polo stick, causing an optic neuritis without definite injury. The condition was long-standing and clear vision had not returned after several months. The author concludes that there was some damage to the optic canal.

In the second case an injury from the same cause

resulted in a subluxation of the lens and repeated attacks of secondary glaucoma. The author feels that complete rest rather than the cocaine used was the important factor in controlling this increased tension.

E. B. FOWLER.

Worth, A. G.: Treatment of Iritis. *J. Ophth., Otol. & Laryngol.*, 1915, xxi, 735.

In iritis mydriasis must be the first object of the treatment. Without measures tending to reduce inflammation no action from the use of atropine can be expected to occur for at least several hours. Massive doses are recommended, oftentimes the pencil is employed, commonly two or four per cent with diamin, and the subconjunctival injections of atropine have given good results. Instillation is insisted upon with the same regularity during the night as in daytime, night is regarded as an especially dangerous period. Also, proportionately more atropine is necessary while diamin is being employed, because it is believed that diamin brings about a quicker elimination of the atropine along with the inflammatory products.

Also, in iritic inflammations accompanying degenerating corneal conditions, more atropine is necessary to ensure constant mydriasis, because less is absorbed by reason of the altered condition of the cornea.

Diamin is atropine's first assistant in that it is a powerful analgesic and lymphagogue. It is held that the subconjunctival injection of salt solution exerts a powerful releasing action when the synchiae posterior are fresh. By the use of this routine the author has frequently observed a change in exudative processes which enables dilatation to take place.

The treatment of iritis is not for the time being, but for the rest of the patient's life — one can never be sure that a recurrence will not occur.

G. D. THORALD.

Kali: Technique of Covering Wounds of the Cornea with Conjunctiva (Sur la technique du recouvrement conjonctival de la corne). *Ann. d'otol.*, 1915, cliii, 25.

Covering with conjunctiva is the most effective way of treating wounds of the cornea, provided of course they are not infected and there is no foreign body remaining in the eye. It should be done as soon as possible after war wounds, and the fact that there is a possibility of infection should not act as a deterrent. There is little danger of its being followed by pneumophthalmia or iridocyclitis, and if it becomes necessary the eye can be removed later. If the wound is not infected this method is the surest protection against secondary infection. But to be effective the wound should be covered for several weeks, while as a rule, with the technique ordinarily used, the wound is uncovered in a few days. This is due to the fact that most operators make a purse-string suture. The inner bleeding surfaces of the conjunctiva are rarely applied to each other all around the orifice, so adhesion does not take place

and a small opening is left, which nullifies the value of the procedure. Moreover, while the conjunctiva is easily brought from the upper and lower cul-de-sac there is considerable resistance from the sides; therefore the suture should be horizontal.

After the eye is anesthetized with cocaine a circular incision is made; it is then brought forward with small forceps, one at each extremity of the horizontal diameter, so that the circular opening is transformed into a horizontal cleft. The two surfaces are then applied to each other and sutured with very fine sutures. This will keep the cornea covered for a month, when the conjunctiva should be clipped with scissors leaving the cornea uncovered again. This allows time for the healing of the wound. The sutures are removed about the tenth day. A. Goss.

Riesman, D.: Soft Eyeball in Diabetic Coma. *J. Am. M. Ass.*, 1916, lvi, 85.

Riesman reports a case of diabetic coma with marked reduction of intra-ocular tension. Some interesting observations appear in the literature in regard to clinical observations and animal experiments. Heine (Mehelberg) goes so far as to say that a soft eyeball in a patient in coma proves the coma to be diabetic. The author does not believe sufficient data has been accumulated to make this certain.

E. B. FOWLER.

Terrien, F., and Ledoux-Lebard, R.: Extraction of Foreign Intra-orbital Bodies Under the Intermitent Control of the Fluorescent Screen (L'extraction des corps étrangers intra-orbitaux sous le contrôle intermittent de l'écran). *Arch. d'ophth.*, 1916, xxxv, 35.

The authors report three cases in which small intra-orbital foreign bodies were removed successfully. In two of these cases previous attempts at extraction by competent specialists failed, but the authors by using the radiographic method located and extracted the foreign bodies. They recommend this method of location in all cases where small intra-orbital foreign bodies must be removed.

A. Goss.

Illig, H.: Local Anæsthesia in Exenteration and Enucleation of the Eyeball with Novocaine. *Arch. Ophth.*, 1916, xlv, 46.

After experimenting with various combinations of novocaine, adrenalin, and potassium sulphate for local anesthesia following hypodermic injection of scopolamine and morphine, Illig fixed upon the following: omit the hypodermic except in very excitable patients (three-fourths hour before operation); one drop of a 5 per cent cocaine solution 25 to 30 minutes, and again 20 to 15 minutes before operation. Three to five minutes after the second drop of cocaine (at least 12 minutes before operation) make a deep injection of the novocaine mixture at the inner and at the outer canthus.

Illig uses a tablet containing 0.25 gr. novocaine and 0.00005 gr. adrenalin in 6.3 ccm. sodium chloride

potassium sulphate solution (7 NaCl 4 K₂SO₄: 1000 distilled water); this solution is then boiled for a few minutes. This 3 per cent novocaine is found sufficient generally; occasionally 4 or 5 per cent is used. The patient should be lying down so that the solution comes in contact with the ciliary ganglion and does not seep forward. A straight platinum-iridium needle 4 cm. long and 0.4 to 0.6 mm. thick is used with a syringe holding 3 to 5 ccm. The injection at the temporal side is made at the outer canthus; the nasal puncture is made just above the caruncle. The needle passes straight back 1 cm., then is directed so as to pass behind the eyeball (3 to 3.5 cm.). One and a half ccm. of the solution is injected slowly. Illig has seen no discomfort or ill effect resulting from the use of this method.

EMORY HILL.

Kerry, R.: Note on the Use of Iodine in Diseases of the Eye. *Ophthalmol.*, 1916, xii, 327.

Kerry thinks that iodine given hypodermically is a valuable remedy in numerous eye diseases, especially keratitis, scleritis, and uveitis. He gives 10 minims of a 2.5 per cent solution of iodine in a fatty combination, making the injection in the flank once or twice weekly. He offers no clear explanation of the good results, but thinks this method effective while free from the difficulty of the local use of iodoform.

EMORY HILL.

Clarke, E.: Some Rare Ophthalmic "War" Cases. *Med. Press & Circ.*, 1916, c, 604.

Clarke reports three cases of war injury. In the first a nickel bullet struck a spade and splintered into minute fragments, some of which struck the patient's eyes. One month after the injury, with no ocular treatment, there was a small corneal opacity and many dust-like particles of nickel in the cornea and a small piece of the same metal superficially located in the lens. Vision was 6/9 with no change after continued observation, so no treatment was undertaken.

In the second case there was complete evulsion of the globe caused by a shell explosion.

In the third case, as a result of a concussion blow, the externals being uninjured, there was a complete detachment of the retina as diagnosed pathologically after the removal of the globe.

E. B. FOWLER.

Saint-Martin: Ocular Surgery in an Ambulance at the Front During the First Year of the War (De la chirurgie oculaire dans le ambulances de l'avant au cours de la première année de la guerre). *Ann. d'ocul.*, 1916, clii, 7.

Eye injuries are comparatively rare in the war, constituting about 3.63 per cent of the number of wounds. The medical affections of the eye are almost entirely ordinary conjunctivitis. Among the eye wounds the most numerous and most serious are penetrating wounds of the eyeball. The prognosis of these cases is rendered much worse by the fact that a foreign body often remains lodged in the

eyeball, which makes enucleation necessary sooner or later. This is the reason why it is of such great importance to have a skilled oculist at the front, furnished with a radiographic apparatus for locating foreign bodies and an electromagnet for extracting them at once. If this is delayed until the wounded are evacuated it increases the danger of infection and loss of the whole eyeball very materially.

A. Goss.

Verhoeff, F. H.: Histological Findings After Iridotaxis. *Arch. Ophth.*, 1916, xlv, 5.

Verhoeff reports the anatomic findings in an unsuccessful iridotaxis operation for the relief of glaucoma explaining the failure to produce permanent benefit. The operation, devised and practiced with remarkable success by Borthen, consists of a keratome incision through the corneoscleral limbus beneath a large conjunctival flap. The iris is drawn between the lips of the wound, some traction exerted upon it, and it is left protruding beneath the flap. The pigment epithelium of the iris should prevent adherence to the anterior lip of the wound and allow drainage from the anterior chamber to the subconjunctival tissues. Additional effects may be the freeing of the filtration angle and opening of the iris crypts from the stretching of the iris. Simple chronic glaucoma is the most favorable type of the disease for this procedure.

Verhoeff's case was of this type, with recent inflammatory symptoms and blindness. For several weeks after operation there was entire relief and normal tension; then pain recurred and the eye was enucleated. Microscopically the iris lined a cyst-like space between the lips of the wound bulging into the episcleral tissues, which showed a proliferation of connective tissue. The sphincter of the iris was at the summit of the cyst, having been displaced presumably by the stretching to which the iris had been subjected. The apposition of the iris to the adjacent tissues precluded drainage. Verhoeff suggests a small iridectomy, as Borthen has lately practiced, but including the sphincter, so that further pulling upon the iris may not draw it within the corneoscleral wound. A possible disadvantage of the iridectomy would be an inflammatory reaction closing off the filtration area.

EMORY HILL.

Valude, E.: Method of Enucleation (*Procédé d'enucléation*). *Ann. d'ocul.*, 1916, clii, 68.

Owing to the number and nature of wounds of the eye caused during the war and demanding enucleation, Valude describes the procedure adopted. Three instruments suffice: a separator, a forceps with wide blades, and strong curved scissors.

The separator being placed or, better still, an assistant holding the lids far apart with a Desmarres instrument, the operator, holding the forceps in the left hand, seizes the eyeball, the forceps blades being planted in each side of the cornea. With the curved scissors the cornea is circumscribed by a rapid section of the mucous at 2 or 3 mm. from

its edge. Without any other instrument the right external muscle is then attacked. This is easily found owing to the traction exercised by the forerun. The muscle is sectioned and through the breach the scissors are pushed as far as the optic nerve, which is also sectioned. With one blade of the scissors inside and the other without, the other muscles and fibrous attachments are easily sectioned from behind outward. The operation is completed within one minute, and under one whiff of chloroform.

A. Goss.

Curdy, R. J.: The Operative Treatment of Squint.
J. Mo. St. M. Ass., 1916, xii, 16.

After touching on the improvements in non-operative treatment Curdy discusses the results and uncertainties of tenotomy and advancement in various forms. His own preference is for a relatively simple suture put into the tendon margin through the conjunctiva (one above and one below), carried forward and inserted parallel to the corneal margin, this being done before the tendon is excised. A suture is placed in the opposing muscle and epischleral so that when a complete tenotomy is done the tendon will be lengthened an amount equal to the opposite shortening. Tendons are cut and sutures tied, the eyes being bandaged for a period.

A very definite statement is made by the author to the effect that only the anatomical and never the functional portion of the squint should be surgically corrected and substituted for non-operative treatment.

E. B. Fowler.

EAR

Lawrence, I. A.: Total Occlusion of the Right External Auditory Meatus. *Proc. Roy. Soc. Med., 1915, 10, Otol. Sect., 5.*

This condition was noticed in a woman, aged 31. The right meatus was occluded by a smooth partition stretching completely across the meatus about a third of the depth from the surface. Careful examination failed to show any opening whatever. There was no moisture or discharge on the surface. No other deformity was found. The eustachian tubes were patent. Râles were heard through a passed eustachian catheter on both sides. The left ear was normal. The patient could hear an audiometer two inches from her right ear. Weber's test was indeterminate. Rinne's test showed the right ear —, left ear +, Schwabach neutral. The author thinks the condition congenital. Otto M. Rott.

Wilson, J. G., and Pike, F. H.: The Differential Diagnosis of Lesions of the Labyrinth and of the Cerebellum. *J. Am. M. Ass., 1915, lxx, 2135.*

The authors discuss three symptoms common to lesions in the labyrinth and in the cerebellum: nystagmus, vertigo, and ataxia. Sufficient data is presented to make possible a differential diagnosis between the pure labyrinthine and the pure cerebellar cases.

Concerning nystagmus it is stated that the cerebellar differs from the labyrinthine form (1) in uniformity of direction and (2) in character.

In labyrinthine lesions the slow deviation is always to the side of the lesion; while in cerebellar disease it may be away from the side of the lesion, depending on whether the lesion is irritative or destructive, and it tends to be irregular in the plane of its direction with the head at rest.

As for the character of the nystagmus, the authors reaffirm their previous assertion that the cerebellar form is essentially ataxic; it is oscillatory, approaching toward an ataxia of the eye muscles. With the animal at rest it was found to lessen or even disappear. It is increased by fixation, tending to diminish behind glasses when the patient ceases to focus.

Concerning ataxia, it is stated that labyrinthine lesions differ from cerebellar (1) in the existence of Romberg's sign in labyrinthine lesions. (2) Variations in the attitude of the head influence the lack of equilibrium of the body in labyrinthine and not in cerebellar lesions. (3) An affection of the labyrinth does not definitely involve those movements of isolated parts which result in dysmetria. (4) In labyrinthine disease movements of rotation or disorientation are not so readily perceived.

Otto M. Rott.

Kopetzky, S. J.: Some Clinical Aspects of Sinus Thrombosis with Special Reference to Pathology. *Am. J. Surg., 1916, lxx, 1.*

From a study of twenty cases of sinus thrombosis, the author concludes that the type of mastoid lesion is an important factor in determining the gravity of a given case of sinus thrombosis and that the hemorrhagic type presents secondary complications more frequently than do other types of mastoiditis.

He believes that the normal appearance of a sinus wall is no indication as to the presence or absence of a thrombosis of the sinus and that the internal jugular should be resected in spite of a normal appearing sinus wall and no evidence of a clot where septic temperature continues and a positive blood culture is found; or with the advent of abscess formations in muscles or joints or endocarditis without positive blood culture.

Secondary lesions, excluding meningitis, while aggravating the gravity of the prognosis, do not necessarily mean a fatal prognosis.

Ellen J. Patterson.

Andrews, A. H.: Brain and Sinus Complications of Otitis Media, with Special Reference to Symptomatology. *J. Ophth. & Otolaryngol., 1916, ix, 351.*

The author divides the intracranial complications into three general classes: meningitis, abscess, and sinus thrombosis.

Meningitis can be of either the purulent or the serous type, and each of these may be general or local.

Abscesses may be extradural, just within the dura, or deep within the tissue of the brain itself.

Besides stating the symptoms found in typical cases of meningitis, abscess, and thrombosis, the author discusses those symptoms common to the three affections, but dwells on the differential points.

The variations of the following symptoms and signs are thus presented:

Headache, temperature, pulse, special sinuses, fundus signs, chills, vomiting, skin and muscle reflexes.

Orro M. Rorr.

Lewis, W. W.: *Apoplexy of the Internal Ear*. *St. Paul M. J.*, 1915, xvii, 820.

The author discusses such primary affections of the internal ear as hæmorrhage, inflammation, hyperæmia, sudden anæmia, concussion, subjection to intense sound and atmospheric conditions, heat stroke, and tonic states from drugs or constitutional disease (pernicious anæmia and leukæmia). The symptoms indicative of such an affection are either of the irritative or the paralytic type and cochlear or vestibular according to which branch is affected.

The irritative symptoms are tinnitus and hyperæsthesia if of cochlear origin, and dizziness, nystagmus, and disturbance of equilibrium if of vestibular origin. The paralytic symptoms are hardness of hearing or deafness if of cochlear origin and loss of reaction of labyrinth when experimentally irritated. If, however, there has been a sudden destruction of the labyrinth, there are irritative vestibular symptoms due to an over-balance from the opposite side, and lasting until compensatory balance is established.

OTTO M. RORR.

Welty, C. F.: *Mastoid Operation Dependent upon Pathology*. *Calif. St. J. Med.*, 1916, xiv, 25.

The author advises the simple mastoid operation in most cases in children under 15 years of age who have had discharging ears for one year or more.

The contra-indications to the simple mastoid operation in chronic suppurative otitis media in children under 15 years of age are:

1. Those that may be present prior to operation as: (a) acute exacerbation of chronic suppuration associated with cerebral symptoms; (b) vertigo, nausea, and vomiting, nystagmus, or facial paralysis; (c) by ear examination, acute or chronic labyrinthitis, or destruction of the labyrinth, fistulæ of the labyrinth, or a case that will react to the fistula symptom, also partial or complete destruction of the tympanic wall, true cholesteatoma.

2. Those that are found during the operative procedure: (a) cholesteatoma; (b) fistulæ of the semicircular canals; (c) such extensive bone disease of the walls of the attic and antrum that it cannot be removed with certainty.

Orro M. Rorr.

Lubman, M.: *Syringing the Ear*. *N. Y. M. J.*, 1916, ciii, 71.

The author calls attention to the fact that water acts as an irritant on chronically inflamed tissue

and that, therefore, it has a very limited field in ear work.

Syringing the ear is never of benefit in chronic diseases, and positive harm is often done by aggravating the pathological conditions present. He reasons by analogy with fistulous conditions in other parts of the body and mentions eczema specifically as being made worse rather than better by the action of water. Syringing may be good for certain aural conditions but it must not be forgotten that pathological conditions change, the disease progresses, and other therapeutic remedies may be used.

The contention of the author that syringing cannot be beneficial in acute and chronic catarrhal conditions of the middle ear needs no argument for its proof, since the origin of the trouble is in the eustachian tube. Syringing in acute suppurative otitis media is permissible since it allays pain and the water softens and ripens the tissues, thus conducing to spontaneous rupture or preparing the way for incision. It also acts as a cleansing agent and helps to absorb the oedematous areas. The use of water should be discontinued when the acute stage has passed and dry wipes substituted to avoid too much softening and a consequent external otitis. If the disease has progressed to the chronic form, water is contra-indicated and unsurgical. It is useless and aggravates the condition by irritation. The excessive growth of granulation tissue is retarded by dryness, encouraged by moisture.

G. M. COATES.

Large, S. H.: *Conservatism and Radicalism in Surgery of the Ear, Nose, and Throat*. *Cleveland M. J.*, 1916, xv, 25.

In reference to tonsillectomy, the author is in favor of enucleation only when there is a definite indication present. He thinks that too many are enucleated without this indication.

Because of the fact that 75 per cent of aural diseases are caused by diseases of the nasopharynx, diseases in this region should be treated radically. Particular reference is made to adenoids and hypertrophies of the posterior ends of the inferior turbinates.

Conservative treatment of the turbinates is advised, except where the middle turbinate has to be sacrificed in order to properly treat or operate on the sinuses. For nasal obstruction, septal resection is more frequently indicated than turbinectomy.

Delay in incising the ear drum in acute otitis media is condemned and if an aural discharge continues longer than three weeks the mastoid cells and antrum should be opened; and if the discharge still persists after another six weeks, some form of the radical operation is advised.

In order to prevent deafness a yearly examination of all patients is advised.

In malignancy of the larynx it is better to err on the side of radicalism than to risk failure by conservative methods.

Orro M. Rorr.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Wishart, D. J. G.: The Origin of the Naso-antral Polyp. *Canad. M. Ass. J.*, 1916, vi, 7.

The author refers to that type of nasal polyp which is solitary, confined to one side of the nose, and extending with the postnasal space, the origin being in the maxillary antrum.

After referring to the reports of Killian (21 cases) and Brown Kelly (11 cases), the author reports 6 cases, in 4 of which the radical antral operation was performed, thus demonstrating the antral origin of the polyp and rendering this point of attachment amenable to curettage and the application of trichloroacetic acid.

The pedicle consisted of a thin band having a very limited point of attachment generally on the posterior or outer wall near the back. The area of attachment was never more than one-half inch, and usually only half that area. Otto M. Korr.

Jones, E.: The Relation of Nasal Disease to Headache. *J. Ophth., Otol. & Laryngol.*, 1910, xiii, 76.

Headache may be caused by the following nasal conditions:

1. Swelling of the mucosa with pressure or irritation of the nerves.
2. Direct contact of the swollen mucosa.
3. Stasis following obstruction of the drainage passages.
4. Negative pressure in the sinus.
5. Re-absorption of toxins formed within the sinus.
6. Ulceration of the mucosa with involvement of the nerves.
7. Any condition which causes active congestion of the cranial circulation, as overindulgence in alcohol, tobacco, etc.

The character of the pain in the various affections is summarized as follows:

1. The pains from nasal affections may be of the most varied kinds.
2. Facial neuralgia and migraine are often due to disease within the nasal accessory sinuses.
3. Headache in the supra-orbital region with superficial tenderness over the painful areas is usually due to pressure from hypertrophy of the middle turbinate.
4. Headache is one of the most common symptoms of sinus disease. When due to the maxillary sinus, there is a full tense feeling over the superior maxillary region of the affected side or pain pressing upward in the outer angle of the eye.
5. Headache in acute frontal sinusitis is present from the very beginning of the disease, first over

the affected sinus, later in the vertex, temporal, or occipital regions.

6. In anterior ethmoid disease there is pain between the eyes; when balled the eyes and nose there may be trouble with the posterior ethmoid cells.

7. The headache in sphenoidal disease is most excruciating within the head and through the temples or occipital regions. Otto M. Korr.

Ridpath, R. F.: The Upper Respiratory Passages in Habitual Users of Cocaine and Heroin. *Laryngoscope*, 1916, xxvi, 53.

The author draws the following conclusions from an examination of 31 patients:

1. The constant use of heroin or cocaine upon a mucous membrane produces a greatly swollen and congested condition, and this is followed by atrophy and anemia of all membranes involved.
2. Chronic users of these drugs do not have the same amount of "catarrhal" affections as people not addicted to its use.
3. The sensibility of the mucous membrane is not affected.
4. Perforations of the septum are not directly due to the drugs used, but when present may be accounted for by a history of constant pricking, abrasion of the mucous membrane by the fingernail with consequent perforation.
5. Cocaine and heroin used in this manner do not produce anemia.
6. The drugs are absorbed by the mucous membrane of the larynx as much as, if not more than, by the mucous membrane of the nose. This is shown by the constant atrophy of the mucous membrane and the engorgement of the vessels of this part.
7. Heroin produces a thin acid discharge. Cocaine causes epistaxis. Otto M. Korr.

Opdyke, R.: Frontal and Maxillary Sinusitis and Sequelæ Due to Staphylococcus Pyogenes Albus. *Med. Rec.*, 1916, lxviii, 18.

The author reports a case wherein a series of severe and obstinate involvements, extending over a period of several months, were due to the staphylococcus pyogenes albus alone and necessitated 21 operations, with complete recovery.

The patient was a man 18 years old who since childhood had had acute articular rheumatism, a mitral lesion, minor attacks of tonsillitis, and acute pharyngitis. He developed acute maxillary sinusitis on the left side. The antrum was drained and the staphylococcus pyogenes albus isolated. Two days later there followed a severe attack of tonsillitis on the left side with quinsy. The abscess

was drained and an autogenous vaccine given without result. Several days later a swelling followed on the left side of the neck. On opening the abscess a direct communication was found to exist between the tonsil and sinus. Slight improvement followed with the exception of pain in the left arm and right thigh. The sinus was aspirated with negative results.

About three weeks later the left frontal sinus was curetted for left frontal headache with prompt relief of symptoms. About two weeks later occipital headache and insomnia developed. The left inferior turbinate bone had sloughed off.

A few weeks later signs of intracranial pressure developed and a decompression operation was performed. Three drams of seropurulent fluid (*staphylococcus pyogenes albus*) were drawn from the fourth ventricle. Improvement lasted one month when another decompression operation was performed. A considerable portion of the parietal, occipital, and temporal bones were resected and thirty minims of fluid aspirated from the fourth ventricle. The constitutional and local symptoms slowly subsided.

Another extensive operation on the frontal sinus was performed on account of sudden severe frontal pain. The patient made an uneventful recovery with the exception of an attack of quinsy. The tonsils were removed and the patient is at present enjoying perfect health. H. A. POTTS.

Mundt, G. H.: Focal Infections of the Accessory Nasal Sinuses. *Illinois M. J.*, 1916, xlix, 38.

Focal infections of the nasal sinuses cause: (1) local troubles, as headache, muscular or accommodative asthenopia, contracted visual field; and (2) general troubles, as the various varieties of arthritis.

To recognize an offending sinus it is not enough to rely on the patient's statement as to whether he has nose trouble or whether there is pain on pressure over the sinuses. OTTO M. ROTT.

Goddard, H. M.: Deflected Septum as a Causal Factor in Sinus Diseases. *J. Ophth., Otol. & Laryngol.*, 1916, xiii, 52.

The author thinks that the cartilaginous deviation gives more trouble than it is usually credited with, and frequently the deviation is of such a moderate degree as not to give rise to nasal obstruction and consequently is often overlooked. The trouble is caused by the deformity obstructing secretion, which then undergoes putrefactive changes.

The author cites two cases in which submucous resection permitted the sinus infection to clear up under appropriate treatment. OTTO M. ROTT.

MacWhinnie, A. M.: The Treatment of Infections of Accessory Sinus. *N. Y. M. J.*, 1910, ciii, 213.

For two years the author has used the following in acute and chronic purulent ethmoiditis:

Application of antipyrine, 4 per cent solution, or

adrenalin with cocaine, 3 per cent solution, to the ethmoid region, allowing the pledgets to remain in place until there is complete shrinkage; application of the author's suction pump with from five to twenty inches of vacuum; injections directly into the ethmoid cells by means of a very fine pipette of a 50 per cent solution of argyrol, 2 ccm. This procedure is carried out daily or on alternate days, depending upon the amount of the reaction, six to twelve treatments usually being sufficient.

In the chronic mucopurulent types, treatment is necessary at first every day and then two or three times a week for three or four months.

Where the hæmoglobin index is below par, the patient is built up with hypodermic injections of iron and arsenic. When the hæmoglobin index is normal, one-twelfth grain of bichloride of mercury in normal salt solution is injected intravenously every other day.

Every patient receives three times a week one capsule of the following mixture after the evening meal: extract of ox-gall 5 gr., calomel 0.5 gr., regardless of whether the bowels move every day or not. The patient's diet is regulated for a period of three days, as it is important that the ration be properly balanced. OTTO M. ROTT.

MacFarlan, D.: Notes upon the Aids to Antrum Diagnosis. *J. Ophth., Otol. & Laryngol.*, 1916, xiii, 12.

Pain and tenderness, and the presence of pus in the nose are of value in diagnosis. Puncture is of great value and should be used more as a routine measure. Concerning transillumination, the following points are important:

1. The light must be powerful.
2. The examining room must be absolutely dark.
3. The light thrown out through the cheeks must be cut down by covering this area with a folded towel or with the hand.
4. A heavy piece of tubing over the lamp is essential.
5. The lips must be tightly closed around the base of the light.
6. The examiner should stand in front of and above the patient, who is seated on a low stool. The patient's eyes should be opened widely, looking up at the examiner.
7. A comparison of the two sides is essential.
8. The pupils should not be expected to light up in all cases; rather the light arc under the lower lid should be looked for.
9. It should be remembered that shadows from old antrum troubles persist.

Concerning X-ray, other diagnostic means are much handier and simpler except for (1) outlining the size and shape of the sinus, (2) in determining the position of the antrum floor, (3) in determining the relation of the teeth to the floor, and (4) in establishing involvement of other sinuses. The probe and the nasopharyngoscope are useful accessories in any examination. OTTO M. ROTT.

Simpson, J. H.: The Treatment of Deflected Nasal Septa. *Am. J. Surg.*, 1916, 103, 5.

Operation is contra-indicated in the very old, in the very young whose facial bones have not attained full growth, and in patients suffering from acute middle ear or pharyngeal lesions, syphilis, tuberculosis, or other grave general disease.

The author considers submucous resection of the septum as a simple procedure to be done with local anesthesia, and when properly performed under aseptic technique should develop neither complications nor sequelae.

He emphasizes the importance of careful nasal examination both external and internal as a routine measure, especially where there is a history of previous trauma, and advocates the use of an intranasal splint rather than adhesive plaster to maintain correct apposition of the fragments.

ELLEN J. PATTERSON.

Morales, A.: Rhinoplasties (Rinoplastias). *Rev. méd. de Sevilla*, 1916, LXVI, 5.

The author describes the case of a man who was bitten by a horse, and a piece of his left nostril torn off. The wound after cicatrization left an extensive mutilation of the face. Fearing operation he ordered an artificial nose, a piece of metal painted to match his skin. The metal piece was applied and was supported by a collodium compound. When his skin would get red a marked contrast occurred between the skin and the artificial nose piece, so he finally agreed to an operation. The operation consisted in refreshing the margins in a beveled shape and forming a flap of the cheek, so as not to produce an ectropion, and according to the Indian method suturing it over the smaller inversion of the pedicle. The operation proved successful.

The second case described was an extensive epithelioma in the nose. The author performed two autoplasmic operations, which proved unsatisfactory. After the first relapse the second followed with greater rapidity than the first. There was no other alternative but the removal of the nose with its entire skeleton. The result of the operation with the rhinotria, gave the patient a most repulsive aspect. A nose was made of aluminum, painted to match the skin. The nose was attached to a pair of spectacles with plain crystals, the nose being soldered at its upper extremity to the eye-glasses. The nose looked perfectly natural, as its upper margin was perfectly adjusted.

The most important point in rhinoplasty is the bony frame. In tertiary syphilis, as it attacks mostly the bony system and produces necrosis, it is most difficult to obtain as favorable results as when the disease is of a venereal origin. In such cases the author performs rhinoplasties on the double plan, combining the flap of the French method with the Indian one. He has not been able to use a metal nose frame, as he thinks it difficult to maintain asepsis in the region of the nose, prominent and exposed as it is to all sorts of conditions.

The case is reported of a man 28 years old, who attempted suicide by discharging the barrel of his gun under his chin, destroying a portion of his right nose. The interesting thing about this case was that the gun was charged with bird-shot, and it went through as a single bullet. The local attending physician applied an external remedy, until cicatrization took place, leaving a disfigurement. Later the author performed a lateral rhinoplasty, by the Indian method. It consisted in refreshing the borders obliquely, and dissecting from the pedicle up to the highest part of the detachment of continuity. To avoid infection of the flap by contact with the tears, he used a warm solution of boric acid. After eight days he removed the stitches and noticed a great retraction of the flap, with a marked thickening in the center, which, below, did not cover by a centimeter the indentation produced by the tissue loss.

Later, other difficulties arose; the median and upper parts of the adherent flap were covered by heavy membranes, beginning at the root of the eyebrows, giving the patient a strange appearance. The author performed a second operation, making use of the thermocautery. It consisted in drawing a flap of muscle over the labial sulcus. The flap was inverted and sutured, covering the part of continuity, forming the ala of the nose.

Afterward, by means of two ellipsoid incisions, the back part of the nose was fixed, removing the heavy skins, which were implanted in the ellipsoidal cutaneous area. A rubber tube was placed in the nasal fossa to keep the aperture open and to prevent retraction. The wound healed well and the patient was entirely cured.

RAFAEL L. VIDUAS.

THROAT

Sanger, F. D.: Some Phases of the Tonsil Question. *J. Ophth. & Oto-Laryngol.*, 1916, 1, 5.

The commonly accepted assumption regarding the supposed function of the tonsil is strongly negated by the fact that the tendency of the tonsil to infection exceeds that of any other organ of the body and as a portal of entry of infection into the body is a great menace not only to health but to life.

The economy attempts to eliminate the tonsil by sealing it in with adhesions as it does a foreign substance which constitutes a menace.

The tonsil resents no injury, thus differing from any other tissue in the body, and its tendency to regenerate harks back to the primitive type, being entirely out of consonance with the more highly organized tissues of the body. ELLEN J. PATTERSON.

Woods, R. H.: Tonsil Technique. *Illinois M. J.*, 1916, XXX, 34.

From an observation of over 2,000 tonsil cases at the Illinois Charitable Eye and Ear Infirmary, the author draws the following conclusions:

1. The tonsil if operated on at all, should be enucleated in their capsule.

2. Enucleations should be done by working between the planes, separating the capsule of the tonsil from its bed.

3. Keeping between the tissue planes is more easily accomplished with a blunt instrument than with a sharp one.

4. Any continued bleeding is dangerous and should be prevented.

5. All alarm and danger are reduced by placing hemostats on bleeding points at the time of operation.

OTTO M. ROTT.

Fischer, L.: Chronic Tonsillitis. *N. Y. M. J.*, 1916, cli, 147.

The author emphasizes the fact that no case presenting gastric symptoms should be permitted to pass with such a diagnosis until a careful examination of the throat, tonsils, and adjacent glands is made, as there are many cases of chronic hypertrophic tonsillitis with frequent exacerbations of fever, headache, vomiting, and anorexia which may be mistaken for gastric or gastro-enteric derangement.

Urinalysis is an important diagnostic aid as many cases show albumin and all have acetonuria and diacetic acid.

Many of these patients suffer from inanition owing to the recurring febrile disturbances which deplete the body and are in danger of developing endocarditis or nephritis from repeated tonsillar infection. The treatment is surgical.

ELLEN J. PATTERSON.

Voislavsky, A. P., and Delavan, D. B.: The Removal of Diseased Tonsils by a Method Minimizing Haemorrhage. *Med. Rec.*, 1916, lxxxix, 89.

The technique used by the authors is as follows: The patient under gas ether anaesthesia lies prone upon the table with the mouth gagged to full capacity and the throat cleared of mucus by the Titus suction tongue depressor. A Beck snare is passed posterior to the right tonsil, the catch spring wire drawn tight and locked and the snare banded to an assistant. The left tonsil is engaged in a second snare and handed to an assistant. The snares are approximated and a tenaculum engages both tonsils. The assistant takes one snare, the operator the second, and slowly both tonsils are enucleated with a minimum amount of haemorrhage, little traumatism, and very little pain following the operation.

Adult patients operated upon under local anaesthesia are given Magendie solution m. 7 with atropine sulphate gr. 1/150 one hour previous to operation. After cocaineizing the mouth and pharynx, the operator injects novocaine in 0.5 per cent solution in the pillars and dissects the tonsils with a Robertson curved tonsil knife.

Surgical treatment of enlarged tonsils was advised as early as 10 A. D. by Celsus and 500 years later Aetius advised removal of the portion of the

gland which projected. In the ages which followed up to the present time controversy has flourished and the interest of the profession in the subject "tonsillotomy versus tonsillectomy," has waxed and waned. In fact few operations have been so frequently performed, with a greater measure of benefit to the patient, and until recently, with less advancement in the positive scientific knowledge of the surgeon.

ELLEN J. PATTERSON.

Israel, S.: The Suspension Laryngoscope (Killian); Its Aid in the Treatment of Tuberculosis and Syphilitic Lesions of the Larynx. *Texas St. J. Med.*, 1915, vi, 436.

Since a study of the literature relative to the frequency of laryngeal lesions in tuberculosis and leues reveals the fact that a large percentage of tuberculous patients, even in the incipient stage, and from 1 to 15 per cent of all cases of syphilis have laryngeal involvement more or less amenable to treatment and cure, it behooves the laryngologist to adopt a method of examining the larynx by which he can make an accurate diagnosis.

In the suspension laryngoscope of Killian the laryngologist has an apparatus with which he can see these lesions at close range; determine accurately their character and extent; and apply treatment conveniently.

Technique. The instrument is secured at one end of the tube, with the patient in the recumbent position, the head extending over the end, supported by an assistant. After anesthetizing the base of the tongue, pharynx, and larynx, the spatula is introduced in the median line to engage the epiglottis and the spatula hook suspended upon the gallows. Thus the operator obtains an excellent view of the intralaryngeal space with little or no discomfort to the patient and has both hands free to apply treatment, medical or surgical.

ELLEN J. PATTERSON.

MOUTH

Horsley, J. S.: Treatment of Cancer of the Tongue and Mouth. *Virg. M. Semi-Month.*, 1916, xx, 500.

There are two possible treatments of cancer.

The ideal procedure would be the injection of a serum whose action would inhibit the growth of neoplastic cells, or of a vaccine which would produce in the system antibodies inimical to such growth, or of a chemical which would destroy and inhibit the growth by its presence in the circulation and tissues. But experiments on lower animals which react to cancer as does man have developed no process of inhibition, immunization, or destruction by means that are of value clinically. The knife and the cautery are the chief, if not the only, treatment that offers salvation.

The extent of the excision beyond that necessary to the enucleation of the growth must depend upon the anatomy of the region involved. The operator will govern himself by the value to the system's economy of the organ or tissue involved, the near-

ness or remoteness of vital structures, the presumable ability to circumscribe, or tendency to permit of metastasis of the tissue in which the growth is found.

It is a general principle that cancer of the tongue and mouth should be excised in one mass wherever possible. The mucous membrane here is thin, offering little resistance to the cancer's inroads; the blood and lymphatic supply is rich. Hence, types of cancer that might remain stationary for years on the skin of the face pursue in this location a rapid and fatal course.

The author states that in the past four years he has operated upon 8 cases of squamous-celled cancer involving the tongue or mucous membrane of the mouth. All were advanced cases. The patients were white, 7 male, 1 female. Either pronounced involvement of the cervical glands or marked recurrence after previous operation or incision was noted in 7 cases, and 3 showed both. The ages varied from 45 to 51 years.

The operations were done under general anesthesia induced either by inhalation or per rectum, and under local anesthesia, cocaine, or novocaine. The advantages of rectal administration are obvious. It avoids the inconveniences of the mask, the danger of suffocation from aspirated blood, and the precautions necessary in the use of the cautery.

Excision of cancerous tissue *en masse* was done wherever possible. The cervical glands were removed in block dissection, clearing one or both sub-axillary areas, or by the Crile operation beginning at the clavicle and dissecting up the sternomastoid muscle, internal jugular vein, and the neighboring tissues in one mass to the mastoid process. When possible, the primary growth was removed with the cautery, or the surface left after excision thoroughly cauterized. Where the large vessels of the neck forbade the use of the Paquelin cautery, the wounds were swabbed out with pure phenol followed by alcohol with the purpose of destroying loose cancer-cells. During the dissection the operated surface was frequently flushed with salt solution, also, to wash away these cells.

In two of the worst cases, the Percy cautery, which develops a low heat under electricity, was used. So far as the author knows, this is the first use of this method in cancer of the mouth. It was devised for and is chiefly used in uterine cancer.

The low heat makes a long application unnecessary, so that injury to surrounding healthy tissue may not occur, or the aspiration of hot air prove harmful. But where an external wound through which the cautery may be inserted exists, the author considers it admirable, superior even to a block dissection. Such conditions would be found in late recurrent cases or after extensive incision.

The cauterization should be continued at least thirty minutes. If the tissues are hard from old scar tissue, the Percy cautery is applied ten minutes and involved tissue is excised. A reapplication is then made, thus gaining penetration.

Of the author's 8 patients, 4 are dead: 2 of recurrences of the cancer, 1 of a pulmonary lesion undetermined, 1 of other causes than cancer but with a small recurrence present at time of death. Four are living, 1 with a recurrence and 3 without recurrence at periods varying from thirteen months to three years and eleven months.

The author holds that this series shows the disastrous results following the excision of a piece for microscopic section when the operation is deferred until later. Such examination should be by frozen section after the patient is prepared for operation, and the operation should be done at once should the microscopic findings indicate it. Any incision tends to spread the cancer markedly and rapidly. The region of the neck should be cleared by a block dissection, removing the tissues in one mass.

Whenever a preliminary excision of tissue is done for the purpose of examination and is not followed by immediate and radical operation, or where through error in diagnosis or planning of the operation incomplete enucleation of the growth or connected tissues is made, operation of the cancer or its recurrence has a very poor prognosis.

Of his 3 patients now living and well, none had any preliminary incision. Of the remaining 5, 4 of whom are dead and 1 living with a recurrence present, a preliminary incision or an incomplete operation was done on each at least several days before the radical operation.

H. A. Porta.

Ivy, R. H.: Relation of the Teeth to the Maxillary Sinus. *J. Ophth., Otol. & Laryngol.*, 1917, XXX, 31.

The author emphasizes the following points:

1. The possibility of infection from a dental source should never be ignored in a case of maxillary sinus disease.

2. The roots of the teeth in direct relation with the floor of the antrum of Highmore may be affected with apical disease in the absence of all ordinary symptoms and signs, the disease being demonstrable only by the X-ray.

3. The antrum is more frequently opened during the extraction of certain teeth than is generally supposed, there being a local absorption of the floor by the dental disease.

4. Considerable difficulty is sometimes experienced in differentiating the X-ray shadow of the maxillary sinus from the outlines of pathological cavities such as cysts and abscesses.

OTTO M. ROTH.

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INTERNATIONAL ABSTRACT OF SURGERY

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COLLECTIVE REVIEW

THE RELATION OF THE DUCTLESS GLANDS TO BLOOD-PRESSURE IN SURGERY

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AN attempt to crystallize our present knowledge of the ductless glands and their relation to blood-pressure as it concerns surgery must be based upon a clear idea as to which of the factors entering into the composite known as blood-pressure might be expected to have any relation to the ductless glands, as well as which of these factors would be of interest to the surgeon. It is of course true that the relation of blood-pressure to surgery is no different from the relation of blood-pressure to physiology, and that a thorough understanding of one problem implies an understanding of the entire question. This is not the place for a discussion of blood-pressure as the problem presents itself to the physiologist; and yet it is necessary to briefly review the general field in order that the factors of blood-pressure, as related to the theory and practice of surgery, may be made perfectly clear in their relation to the whole field, and particularly in their relation to the ductless glands (1).

The term "blood-pressure" refers to the tension of the arterial wall produced by the systole of the ventricle and transmitted by an incompressible fluid. Three elements enter into this apparently simple proposition: hydrostatic pressure, the pressure due to the weight of the fluid itself; hydrodynamic pressure, the pressure due to movements within the fluid itself; and hydraulic pressure, the pressure caused by force exerted upon the contained fluid by the vessel

walls and their external factors, the fluid being contained within a closed system of elastic tubes. Hydrostatic pressure often interests the surgeon, though not in connection with our present discussion; he makes use of it in its most simple application in combating the cerebral anæmia of a fainting patient—the patient being placed in a prone position so that the mere weight of the blood will carry it toward the head, or at least not away from it. Hydrodynamic pressure hardly interests the surgeon; its consideration is essential to an understanding of certain phenomena of the transmission of pressure, such as are encountered in the study of the pulse-wave.

The hydraulic pressure of the blood is the resultant of a primary force generated by the contraction of the heart acting against a resistance produced by the friction of a viscid fluid, chiefly in the small vessels of the periphery. The resistance to the force exerted by the systole of the heart results in a tension of the vessel wall. This tension, which is what is meant by the term "blood-pressure," depends upon the elasticity of the wall and the force which stretches it. The elasticity of the wall depends upon the inherent elasticity, due to the presence of elastic fibers and membranes, and upon the so-called "tone" of the involuntary muscle-cells which form the chief element in the wall of the arteriole. By "tone" we mean the peculiar condition of partial contraction characteristic of the normal smooth muscle-cell, an inherent property more specifically

termed "myotatic irritability"—the responsivity to the mechanical stimulus of stretching.

The force acting to stretch the vessel wall will depend upon the amount of blood in the vessel, which is in turn dependent upon the relation of the inflow to the outflow. The inflow will depend upon the volume of blood forced out of the heart at each systole and upon the rate of the heart-beat; the outflow will depend upon the resistance, especially the resistance in the arterioles, and the consistency of the blood. Controlling all these factors, balancing one against the other, or even balancing a dilation in one part of the body by a constriction in another part, is the vasomotor system.

If we now seek among these factors for those which might be directly influenced by the ductless glands, we find two, the tone of the muscle-cells of the arterioles and the increased resistance in the arterioles, caused either directly by a contraction of the muscle-cells, or indirectly by an increased responsivity to vasomotor impulses. I have spoken only of the arterioles, since physiologists are now agreed after some years of disputation that it is in the finest branchings of the arteries that a resistance could be encountered, first, on a basis of physics—the blood passing from the arterioles into the capillaries enters a system of greater cross-sectional area and therefore of diminishing resistance; and second, because the arterioles contain the only device found in the periphery by which the caliber of the vessels can be changed; namely, the smooth muscle-cells which in the arterioles constitute the only element in the vessel wall except the endothelial lining. It has been calculated that by far the greater portion of the total blood-pressure is spent in the small arteries and arterioles, the capillaries using but one-fourteenth of the total (2).

BLOOD-PRESSURE FROM THE CLINICAL VIEW-POINT

It seems advisable to step for a moment beyond the strict bounds of this review and consider from the clinical side the blood-pressure conditions which interest the surgeon. Surgery has to deal with the acute or semiacute failures of blood-pressure which are unfortunately grouped together under the term "shock"—a term when so used of about as much descriptive power as the term "rheumatism" in medicine—and for which some ill-defined failure of the vasomotor center is quite frequently held responsible. Because of the complexity of the problem of blood-pressure, which I have endeavored to in-

dicate in the simple recapitulation of the factors involved, added to the vagueness of the clinical concept of shock, it is quite natural that many theories have been evolved. My own belief is that the chief cause of this confusion is the attempt to explain all forms of death accompanied by low blood-pressure on the same basis. It is certain that the characteristic symptom of shock—low blood-pressure with congestion of the splanchnic area—can be produced by several primary factors, and in the interest of clarity of ideas, especially as regards practice, I suggest that the conditions which may be followed by low blood-pressure and consequent death be separated into four groups. I appreciate the difficulties confronting the clinician when attempting to bring certain cases under any classification; but I also appreciate that the present confusion leads nowhere either as to theory or as to treatment.

First, I would define as syncope, from *evyropsis*, a cutting short, the condition in which the blood-pressure falls because the function of the great autonomic centers is cut off short. A blow on the head may result in immediate syncope (cutting short of function) if the force be sufficient to cause that condition of the cerebral centers best spoken of as *commotio cerebri*; or else a hæmorrhage or a cerebral œdema follows, and the intracranial pressure rises until it cuts short the function of the centers. The bounding pulse characteristic of the early stages of this condition is sufficient proof that the vasomotor mechanism is performing its function. It is obvious from the practical side that in such a condition the head should not even be lowered, as the pressure in the cranium would thereby be merely increased by adding the factor of gravity in the venous system to an already dangerous pressure; nor would bandaging of the limbs, nor stimulation of the vasomotors, nor infusion of salt solution be indicated. The only direct indication is to relieve this pressure on the centers. The condition is largely a mechanical one, and the ductless glands do not enter into the problem.

Second, I would define as collapse—*collabere*, to fall together—the condition in which by the phenomenon called cardiac inhibition the machinery of the circulation fails, the complex mechanism of cardiac activity falls to pieces, as it were. This is a condition seen after a blow on the chin or on the larynx, or after a blow over the solar plexus, and is probably the common cause of deaths under inhalation anesthesia, especially in operations about the larynx. Here, again, the ordinary vasomotor stimulation is not indicated, although it is perhaps possible to

hope by excessive vasomotor stimulation to overcome the inhibition.

Saline infusion, bandaging of the extremities, transfusion of blood—all this is contra-indicated; the engine is stalled, and putting on more load will not start it. While this condition is not thoroughly understood, and we consequently have no satisfactory suggestion for treatment, there has been no suspicion that the ductless glands play a rôle in cardiac inhibition.

In a third class I would place hæmorrhage. Without denying that loss of blood may be a factor in the production of the clinical condition, which appeals to my mind as true surgical shock, I still object to grouping deaths due to hæmorrhage under the caption of "death from shock." Death occurs after hæmorrhage at a time when a sufficient quantity of red cells is still left in the body to carry on all the normal functions of the blood, but when the fluid column of the blood has become so diminished that the heart cannot get a grip upon it; it is here that the factors of hydraulic pressure, of amount of fluid in the vessels, of relation of inflow to outflow, of rate of heart-beat and diastolic filling of the heart, of coronary circulation, etc., enter into the problem. If we now simply increase the amount of fluid contained in the vascular system, all these factors are influenced favorably, and the heart can once more resume its work. The problem of what to use to increase this fluid content of the body is to my mind not yet settled. Salt solution does well in most cases, but a loss of a large proportion of the formed elements of the blood with the restoration of the fluid amount by salt solution alone must diminish the viscosity of the blood and thereby greatly lower the normal peripheral resistance. It may be for this reason alone that the running pulse of hæmorrhage does not always properly react to saline infusion.

It is possible that modern colloidal chemistry will offer some substitute for saline which will enable us to keep the viscosity of the blood nearer its normal. That such a loss of blood would affect the ductless glands in common with all the structures of the body must be taken for granted; but such secondary effect upon them is not the subject of our present discussion.

SURGICAL SHOCK

Now, having ruled out head death, heart death, and hæmorrhage death, what is left to constitute the group which might be called shock? True surgical shock is to my mind the condition marked by a gradual, persistent, progressive fall of blood-pressure, such as characterizes cer-

tain cases after extensive crushing injuries with practically no loss of blood, cases of extensive burn, and many intra-abdominal conditions, particularly high intestinal obstruction, or ileus, and acute hæmorrhagic pancreatitis. These in my opinion are instances of primary failure of the peripheral mechanism, by means of which the vasomotor center accomplishes the task of dilating here, constricting there, and so balancing dilation and constriction that the general pressure remains near a constant level. It is in this group of cases that the ductless glands might be expected to play a part.

While admitting the essential physiological inadequacy of such a comparison, we would ask pardon of the physiologist, and in order to make the point more concrete assume that the whole system is like a modern plant in which a central engine, the heart, performs direct work as a pump and in addition a part of its energy is directed to an electric generator, the vasomotor center, which through a wiring system, the cord and the peripheral nerves, but particularly the sympathetic nerves, transmits energy to many small motors, the machinery which transforms this energy into work at the periphery, the muscle-cells of the arterioles. Now the central plant may be in order, the electric generator running smoothly, the wiring system intact, but the small peripheral motors are broken, or only the carbon brushes—the myoneural junctions—are defective. The condition which concerns us in true surgical shock is, I believe, a failure of the small peripheral motors, the musculature of the arterioles, the only mechanism by which the energy of the vasomotor centers can be transformed into the work of increasing or diminishing the resistance to the force of the systolic contraction of the heart and thus varying that tension of the blood-vessel wall which we call "blood-pressure."

INFLUENCE OF DUCTLESS GLANDS

The manner in which the ductless glands influence the blood-pressure is by the production of a substance which either directly causes the smooth muscle-cell of the arteriole to contract, or else acts upon the substance which intervenes between the nerve-ending and the muscle substance itself, the myoneural junction, perhaps thereby rendering the muscle more responsive to the control of the nerves. The product which is best understood, and which in all probability is the one with which we are most concerned, is a pressor or blood-pressure raising substance produced chiefly in certain cells of the suprarenal gland. The extracts of nearly all the glands

and tissues of the body yield depressor substances; but I am aware of no work up to the present which would indicate that blood-pressure is lowered through the activity of a depressor hormone, although such a possibility would not be entirely unreasonable.

The possible extent of the effect of this suprarenal secretion is seen in the fact that in cats while adrenalin is active, stimulation of the vagi does not produce cardiac inhibition, and stimulation of the depressor is not followed by a fall of blood-pressure; or in other words, the chemical action of the suprarenal product may outweigh the effect of nerve impulses by producing an almost maximal stimulation of the myoneural substance.

The suprarenal gland is a composite organ which derives its name simply from anatomical relationship. It has been assumed to have no relation to the kidney except a topographical one, although Cow (3) in a very recent article claims to have demonstrated direct vascular connections with the kidney and through these connections direct control of kidney function. The division of the gland into two parts, the cortex and medulla, is likewise grossly anatomical. The two parts are, so far as we now know, independent, and, indeed are in some species anatomically independent. The cells which lie on the outside of the gland in the higher vertebrates are apparently related to the sex glands, and like the cells of the sex glands, are derivatives of the mesoderm. It is stated that these cortical cells, sometimes known as the interrenal system, can be entirely removed from a pregnant animal (4), when the cells of the corpus luteum seem to take over their function. Under other circumstances, as shown by Blevi (5) in his work with cartilaginous fish, in which the cortical or interrenal cells form structures independent of the medullary or chromaffine cells, the interrenal system is essential to life.

This close embryological relation to the sex glands doubtless explains why aberrant or supernumerary bodies made up of these cells alone may be found along the spermatic cord and even in the epididymis or in the ligamentum latum. The function of the cortical cells of the suprarenal, or the interrenal system, therefore, does not concern us here.

The cells of the interior of the suprarenal gland, or the medulla, belong to a widely scattered group of cells derived from the sympathetic nervous system and therefore are of ectodermic origin. They may be looked upon as nerve-cells which have taken on glandular functions. Grouped together they are known as the chromaf-

fine cells, and in their entirety as the chromaffine system. The term is based on the peculiar affinity possessed by these cells for chroma acid or its salts (6) and should not be confused with the term chromophile (χρῶμα, color, φιλῶ, to love) which is applicable to any cell which takes a dye with unusual ease. These chromaffine cells are found in greatest number in the medulla of the suprarenals; they also occur in the sympathetic paraganglia which appear along the course of the sympathetic nerves, in the carotid body, and in Zuckerkandl's organ. Vincent (7) believes that investigators have not given sufficient attention to this "extracapsular" chromaffine tissue, the total amount of which exceeds the amount contained in the suprarenal medulla.

The work of Langley (8), Elliott (9), Brodie and Dixon (10), and others have shown that the product of the chromaffine cells acts upon a given structure in exactly the same manner as does stimulation of the sympathetic nerve supplying that structure; therefore some muscular structures, for instance, react to adrenalin by contraction, others by relaxation.

From this fact it is concluded that the chromaffine product does not influence the muscle tissue itself, and since its activity is manifested after degeneration of the nerves (9) it cannot be the nerve itself which is influenced. The comparative study of adrenalin and many other substances led Langley (8) to the conclusion that the point influenced by adrenalin must be a substance interposed between the muscle and nerve—the myoneural junction.

The question of the function of this chromaffine system seems to be undecided only as to its extent. Biedl concludes (11) from his exhaustive review that "*Die physiologische Adrenalinaemie fuer den ständigen Tonus sympathisch innervierter Organe, vor allem fuer den Gefasstonus und Zuckertonus von ausschlaggebender Bedeutung ist.*" Vincent concludes (12) that—adrenalin is constantly poured out into the circulation; the most generally accepted theory concerning the purpose of this secretion is that it helps to maintain the tone of the muscular organs which are innervated from the sympathetic, and especially the muscular wall of the blood-vessels; the final determination of this question demands further work. Cannon (13), on the other hand, doubts that the maintenance of normal tone is dependent upon the suprarenals and thinks they are reserves for times of stress, such as in conditions of fear, emotional excitement, etc., when an increased activity of the suprarenals can be demonstrated. Cannon states further, however, after giving his reasons

why suprarenal secretion cannot be a factor in maintaining the normal high tonus of the vasomotor system, that "It is probable, however, that incredibly minute amounts of this substance in the circulating blood somehow sensitize the myoneural junctions of the sympathetic system, and thus aid the nervous action."

My own experience leads me to the conclusion that the suprarenals are concerned in the maintenance of normal vascular tone. If these organs are removed and a continuous kymographic tracing is made over a period of several hours, no change will be found to occur except a gradual, persistent fall of blood-pressure. I have never obtained what is to me the picture of surgical shock in any other way (14). It seems therefore agreed that the chromaffine system is concerned in the maintenance of vascular tone at one time or another.

It seems then justifiable to conclude that destructive changes in the chromaffine system would result in low blood-pressure, accepting the majority opinion, or in an inability to meet an emergency demand, such as the emotional excitement of a surgical operation, if we agree with Cannon. Such changes, tending toward a lessening of function, have been described in many conditions which may concern the surgeon. Thus Battelli and Roatta (15) found a reduction to one-third of the minimal normal amount of adrenalin in the suprarenals of dogs which had run in a treadmill until fatigued. Schur and Wiesel (16) confirmed these results, finding a reduction in the cells of the medulla, and disappearance of chromaffinity, of reaction to ferric chloride, and of production of mydriasis by extracts of such organs.

Certain constitutional diseases, such as the status lymphaticus, are marked by an hypoplasia of the suprarenals. This finding was confirmed on a large material by Hedinger (17). The fact that patients in this condition seem especially susceptible to accidents of narcosis led Schur and Wiesel (16) to an experimental study of the effects of narcosis upon the chromaffine system. They found that the specific cells of the medulla of the suprarenals showed a progressive loss of affinity for chromic acid salts, this decreased staining reaction becoming more marked as the time of narcosis lengthened until, after three to five hours' narcosis, no more chromaffine cells were found; synchronous with this loss of chromaffine substance was the disappearance of the mydriatic action of extracts of such suprarenals on the enucleated frog's eye, and the disappearance of the iron chloride reaction. If the

animals were allowed to recover from the narcosis, the chromaffine reaction reappeared, the time of reappearance varying, until from eight to twelve hours later the cells possessed their normal affinity for the chromic acid salts. The extract of the suprarenal after five hours' narcosis showed no physiologic effect in one experiment. The result was the same with ether, chloroform, or Billroth's mixture.

Parkinson (18) states that he found no chromic acid reaction in the medulla of the suprarenals from two cases of post-operative shock.

Hornowski (19) found in four cases of post-operative shock a condition similar to that reported by Parkinson. His experimental results are practically the same as those cited from the work of Schur and Wiesel. Hornowski's most interesting conclusions are the following: "Chloroform increases the need for tonic substance and at the same time causes an exhaustion of the chromaffine system which may cause death. . . . Chloroform does not cause an immediate exhaustion of the tonic substance, but gradually, after several hours. . . . Chloroform may cause a sudden exhaustion of the chromaffine substance if it be not present in abundance. . . . The resistance of the organism to surgical shock is expressed in the possibility of satisfying a greater need for tonic substance, and in the ability of the organism to secrete it."

Kostlivy (20) reports two cases, one of death occurring seventy-two hours after narcosis in which the chromaffine substance was found intact; this he explains in the sense of a regeneration following Schur and Wiesel. A second case in which death occurred twenty-four hours after narcosis showed no demonstrable chromaffine substance.

Schwarzwald (21) concludes from a study of ten cases of death during and after narcosis, in seven of which the chromic acid reaction of the suprarenals was found intact, that the question of the integrity of the chromaffine tissue under the influence of narcosis does not possess decisive importance. He is doubtless correct that such a theory will not explain all cases of death in narcosis, and it is interesting, in view of the attempt cited above, to clinically separate the cases called shock, to find among Schwarzwald's cases three in which fatty degeneration of the heart was noted and a fourth case dying in eclamptic coma.

Kohn (22) endeavors to prove by extensive experiments that the work of Schur and Wiesel is based upon untrustworthy technique, and that, therefore, their results are incorrect.

After the removal of the suprarenals it has been

found that the pancreas begins to secrete and may show an astonishing secretory activity through a long period until the animal's death (14). This fact, together with the fact that adrenalin inhibits the flow of pancreatic juice, which follows the intravenous injection of secretin, leads to the conclusion that the suprarenals exercise some sort of control over the pancreas.

After prolonged etherization there may occur a flow of pancreatic juice, which may possibly mean that the suprarenals have been so affected by the narcosis that they have lost their control over the pancreas—in other words that the suprarenals are exhausted.

The effect of various pathological processes upon the chromaffine system has been studied. Thus Langlois (23) found that extracts of the suprarenals after chronic infections were totally inactive. The same was found by Luksch (24) to be true of the extracts of the suprarenals of rabbits poisoned by the toxins of diphtheria, tuberculosis, and typhus.

The relation of the chromaffine system to the vasomotor center has recently attracted the attention of many workers. The work of Biedl (25), Asher (26), Cannon (13), and Elliott (27) has demonstrated that the suprarenals are under the control of secretory nerves and that these secretory fibers are found in the splanchnics. The importance of this finding to our present discussion is seen in the conclusion of von Anrep (28) that "every rise of blood-pressure brought about by the agency of the nervous system, thus involves the co-operation of the chemical mechanism represented by the suprarenal glands." From the pharmacological standpoint, this relation between the suprarenals and the centers has been shown. Richards and Wood (29) show that an increased secretion from the suprarenals occurs after the injection of strophanthin, but this increased secretion does not occur if the splanchnics or the cervical cord are cut; therefore strophanthin must influence the suprarenals indirectly by a stimulation of the centers. Elliott (27) finds that ether affects the secretion from the suprarenals, though not if the connections with the center are cut; hence the effect upon the suprarenals must be an indirect one through the splanchnics. His conclusion is that all conditions of anesthesia are attended by exhaustion of adrenalis, but that ether, chloroform, and other drugs, such as pilocarpine and physostigmine, or even diphtheria toxin, appear to have no exhausting action directly on the suprarenals—to which he adds the note, "Ultimately, however, the glands must be capable of automatic excretion

for the decentralized gland suffices to keep the animal alive. If in a cat the suprarenal on one side be removed and the splanchnic nerve of the other divided, the cat does not die until the second suprarenal has also been excised."

There are then three factors in the problem of the relation of the ductless glands to blood-pressure: first, the glands themselves which are probably subject to physiological and pathological changes. The evidence of such changes can hardly be considered absolute, but the weight of evidence points toward the conclusion that such changes do occur, even to the point of entire loss of pressor product. These glands are under the control of the second factor, the nerve-centers, so much so that if we agree with von Anrep (28) the changes in blood-pressure brought about through the agency of the nervous system are caused in part indirectly through the medium of the ductless glands. Elliott concludes: "It appears probable that the suprarenal glands are played upon by the splanchnic nerves in the emotional and vasomotor reflexes with almost as delicate and ever-changing an adjustment as are the muscles of the peripheral tissues connected with the sympathetic nerves."

There is no evidence to show that the failures of the ductless glands to secrete are due to central disturbances, although such a possibility cannot be denied. Concerning the third factor, the muscle-cells of the arterioles, there is no evidence at hand to show that they are subject to physiological or pathological changes—except such as concern the myoneural junction, which is strictly speaking not a part of the muscle-cell—which would render them incapable of responding to vasomotor impulse or to the chemical stimulus of the chromaffine product.

CONCLUSION

It seems to me fair to conclude that in hyperplastic conditions, such as the status lymphaticus, and after chronic infective conditions and acute intoxications so commonly met in surgery, the chromaffine system is not normally productive (30).

If we agree with Cannon that this product is a reserve for times of stress, we find a basis in theory, in addition to the teachings of common humanity, for the avoidance of all pre-operative influences which tend to cause fear or excitement; if we agree that ether creates an abnormal demand for this chromaffine product, we have a basis in theory for the use of gas oxygen; in any case in which a hypofunction of the chromaffine system is suspected, or in which a hyperdemand

for this substance may be expected, the use of small amounts of adrenalin continuously administered in saline solution during the operation is undoubtedly indicated.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Cunéo, B.: Disinfection and Immediate or Early Reunion of Recent Wounds (*Disinfection et réunion immédiate ou précoce des plaies récentes*). *Bull. Soc. de chir.*, 1916, xlii, 225.

Cunéo asks, "Can a recent wound, say from 6 to 12 hours old, be disinfected to such an extent as to allow complete immediate or early union? Is it obligatory to submit such wounds to continuous lavage lasting several days, and institute a bacteriological examination to assure that disinfection is sufficient to allow reunion?"

As a matter of fact Cunéo has ignored such practice for several months past, and has disinfected and sutured wounds on the spot. He simply irrigated the wound with pure or diluted oxygenated water, tincture of iodine, etc., and removed foreign particles. In nine out of ten cases the wound did not present any complications. If the trajectory was infected he ripped it up. Hundreds of cases have been thus treated. He particularizes a severe gunshot wound where the projectile had entered the exterior face of the left knee, and had its exit in the anterior part. In its trajectory the bullet traversed the external condyle of the tibia had caused multiple fissures. The point of exit was at the crest of the internal border of patella, fracturing this bone and tearing the capsule and skin. The wounded man had been lying with his knee on the ground for sometime. Cunéo widened the tear, cleared the bony passage of the bullet, washed it with oxygenated water, and immediately sutured his incision and the cutaneous wound. Recovery was without the least incident of infection.

Sometimes Cunéo has tamponed such wounds for some hours before closure. He is satisfied that the results obtained by this method are superior to those obtained by the older procedure, and he criticizes the unnecessary official regulations which oblige an adherence to these older methods. A. Goss.

Gorla: Preparation of Catgut (*Préparation du catgut*). *Bull. Assoc. de méd., Par.*, 1916, lxxv, 145.

Preparation of a sterile and strong catgut depends more on the manufacture of the cord than upon the means of sterilization of this cord when finished. In a cord badly made sterilization is very difficult, in fact with cords not properly protected

from possibility of infection by contact during the various stages of manufacture, there is no sterile catgut.

The author shows the steps in the manufacture, and how infection may take place during these steps. Preparation of cords starting with aseptic strands is the only solution to ensure sterility. At every step they must be in accordance with our notions of bacterial asepsis. They are finally immersed in a sterilizing solution. The author prefers tyndallization in an eucalyptol-alcohol medium slightly glycerinated (5 days, 10 hours per day at 66°C.; alcohol at 60°C.). This gives a sterile catgut sufficiently supple.

It is only by operating with cords prepared from sterile strands that catgut accidents can be banished from surgery. A. Goss.

Fonio, A.: Coagulen Bandages (*Coagulenverbandstoffe*). *Deutsche med. Wochenschr.*, 1916, xlii, 163.

Fonio outlines the advantages of bandages saturated with coagulen in the treatment of hemorrhagic wounds, or as tampons in the case of wounds which on account of infection must be treated openly. W. A. BRENNAN.

Chaput, H.: Six Observations of Filiform Drainage (*Six observations de drainage filiforme*). *Bull. Soc. de chir.*, 1916, xlii, 163.

Chaput for some time has discarded the use of tubular drains in pathologic cavities and replaces them by filiform drains. These consist of threads of varied caliber. The drainage is capillary. The threads may be silk or caoutchouc varying in diameter from 3 millimeters or less to 6 or 7 millimeters in large cavities. He says that these drain much better than tubes and permit a more rapid recovery with an insignificant cicatrization. He reports six cases of abscesses and sinuses in which this method was followed with the results claimed. A. Goss.

ASEPTIC AND ANTISEPTIC SURGERY

Delbet, P.: Action of Certain Antiseptics on Pus (*Action de certains antiseptiques sur le pus*). *Bull. Soc. de chir.*, 1916, xlii, 97.

Delbet reports a number of further important experiments to supplement his previous communica-

tions on the disturbing action of disinfectants, on the defenses of the organisms, and the cellular defence by phagocytosis, in the case of infected wounds. In these experiments he has studied the action of disinfectants on the pus itself.

While some of his results were paradoxical in general even under conditions in every way favorable to the antiseptics, inasmuch as the pus specimens were immersed for 24 hours in the antiseptic solutions, yet sterilization was exceptional. Abundant cultures were generally obtained. The solution which has most frequently given sterilization is phenic acid 2 per cent. Stronger solutions were not tested. Pyocultures in phenic acid with 15 different samples of pus showed sterile bouillon 6 times.

With other solutions the results were:

With ether, twice sterile out of 8 pyocultures.

With sublimate twice sterile out of 9 pyocultures.

With oxygenated water once out of 6 pyocultures.

With Dakin's fluid twice out of 12 pyocultures.

But it is not quite correct to say that sterilization is absolute since only a small quantity of pus was used and with larger amounts perhaps more frequent cultures would have been obtained. To explain why the number of microbes often increases in wounds dressed with antiseptics he formulates three hypotheses: (1) alteration in the leucocytes with the diminution or suppression of phagocytosis which it causes; (2) modifications in the vital fluids disturbing or suppressing their bactericidal properties; (3) the tolerance of microbes to antiseptics.

Delbet pays particular attention to the latter. He has obtained streptococcal cultures in a medium containing 20 drops to 2 per cent of phenol solution for 4 ccm. of bouillon. He has also developed these microbes in solutions saturated with ether. Tolerance of bacteria to disinfectants is therefore established.

Delbet considers that antiseptics can only reach microbes through the pus and in so doing they must act on the pus. In this action certain substances are formed which are favorable to the nutrition of the microbes. This further hypothesis explains why microbes persist in great numbers in certain points where antiseptics are applied in infected wounds.

From his experimental researches Delbet claims that the application of a powerful antiseptic, such as Dakin's fluid, to an infection area which is only slightly favorable as a culture point can turn that point into a good culture medium. A. Goss.

Cuneo, B., and Meunier, L.: *The Concentration of Surgical Solutions* (La concentration des solutions chirurgicales). *Bull. Soc. de chir. de Par.*, 1916, xlii, 300.

Since recent war surgery experience has demonstrated that aseptic dressings alone will not suffice there has been a return to the use of antiseptics. Clinical and laboratory experience has shown, however, that our former notions of antiseptics must

be modified. We must admit that no antiseptic solution must be placed in contact with a wound which may be injurious to the neighboring tissues. Protection of the cells, which Delbet calls "orthophylaxy," must be borne in mind. The ideal solution which can destroy microbes without destroying the elements of the organism is still a desideratum.

The experimental work of the authors is based on the conception that in every infected wound, the cell, the phagocytary element, plunges into the purulent secretion which constitutes its natural humid dressing. It is very evident that the organism must tend to give this pus, the phagocytary battlefield, that concentration which permits the living cell in this milieu to struggle with maximum efficiency against microbial invasion.

To study such pus concentration therefore appeared to the authors the most scientific method for finding the concentration which any surgical solution must have which is destined to treat infected wounds. Pus may be considered as a serous fluid holding microbes and leucocytes in suspension. Its concentration is a function of the peptones, salts, etc., dissolved in it, also of its osmotic dilution.

The method used to study concentration of pus was cryoscopy, as being most clinical and most exact. The pus was filtered. From this first series of experiments the authors draw these conclusions: (1) Pus serum has different cryoscopic indices varying with each type of pus. (2) The cryoscopic indices of different kinds of pus may be ranged in two groups. High indices belong to those furnished by patients with high temperature or gathered at the moment of incision; weak indices come from pus taken from cavities already opened and without great thermic reaction.

In a second series of experiments the authors sought the cryoscopic index of pus taken from the same wound at different stages of its purulent evolution. They found that the purulent serum had a varying cryoscopic index corresponding to the function and the age of the wound. Towards recovery this tends towards 0.40. Their experimental results agree with the clinical experience of Delbet who found that MgCl solution at 12.10 per cent gave the best leucocytary action, also with those of Richet who found that this solution at this concentration was most favorable to the development of lactic ferment.

The practical conclusion from the author's study is that the surgeon should only dilute the purulent serum of wounds with solution whose concentration equally tends towards the recovery index, i.e., 0.40. Examples of such surgical solutions are tabulated. A. Goss.

ANÆSTHETICS

Ugaz, R.: *Regional and General Anesthesia* (La anestesia regional o territorial). *Tesis*, Lima, 1917.

The conclusions of the author's thesis are as follows:

1. Anesthesia, local, regional, or general, is the most precious conquest of modern surgery. Its importance is indisputable and its future brilliant.

2. It is impossible to be exclusive in weighing the evident superiority of one method of anesthesia over another.

3. The combination of novocaine and adrenalin is physiologically potent, of great anesthetic value, and is a hemostatic and cardiotonic.

4. During the course of operations, never has he seen any disagreeable accidents occur to the patient or the surgeon as a result of the anesthetic.

5. No post-anesthetic or secondary accidents, vomiting, neither pulmonary nor cardiac, hepatic nor renal lesions, followed the use of the above anesthetic; that is why its use is recommended in all such interventions in which the anesthetic might prove injurious to those organs.

6. The innocuity of novocaine, permits of its use in large doses.

7. The vasoconstrictor action of adrenalin, which allows of a nearly bloodless operation, "making it equal to a dissection upon a cadaver," fills the need existing among other local anesthetics.

8. The physiologic preparation, being an isotonic solution, eliminates the inconveniences resulting from an acute intoxication, especially bulbar anesthesia.

9. The method is found to be an excellent one; the results, doubtful or bad, are due to improper technique.

10. These conclusions are based upon the author's practice in the Mayo clinic. **RAOUL L. VIGRAN.**

Jacobson, J. H.: Local Anesthesia in Abdominal Surgery. *J. Mich. St. M. Soc.*, 1916, xv, 57.

The principal advantage of local anesthesia over all other methods is the all important factor of safety. The author believes that no operation on an adult should be performed under general anesthesia which can be equally well performed under local anesthesia. Novocaine, 0.5 per cent, adrenalin, 1 to 5 drops per ounce, is the solution usually employed by the author, who finds that the patient complains only during pulling and tugging, and that food may be taken shortly after the operation since there is seldom vomiting.

The technique employed by Jacobson is essentially that described by Braun. The line of incision is blocked off by completely surrounding the area with a barrier of novocaine. In abdominal surgery, after the wall has been incised, any operation which does not involve tugging and pulling on the viscera can be performed. Local anesthesia is particularly indicated in the presence of alcoholism, nephritis, acute pulmonary lesions, and myocarditis. Operations on the abdominal wall, suprapubic cystostomy, gastrostomy, jejunostomy, enterostomy, cholecystostomy in debilitated patients suffering from empyema of the gall-bladder or severe jaundice from obstruction of the common bile duct, appendectomy in tuberculous patients, all forms of hernia

and typhoid perforations should always be performed under local anesthesia. The author has performed 146 abdominal operations under local anesthesia, 197 of which were for hernia. He has found the method of great help when combined with general anesthesia to lessen extreme rigidity of the abdominal muscles.

E. Fournier.

Beebe, H. M.: Some Experiences with Local Anesthesia. *J. Am. Inst. Hygien.*, 1915, viii, 845.

The author endeavored to ascertain the value of novocaine anesthesia as a routine procedure, using a 0.5 per cent solution prepared by the hypodermatic administration of 0.25 grain doses of morphine with 1/150 grain of atropine. The method requires a careful technique in that tissues not anesthetized must be gently handled. The time of operation was found to be considerably increased over that required by the general method.

Fifteen partial thyroidectomies were operated upon under local anesthesia, in three of which thorough infiltration of the skin was sufficient for the complete operation. In the others an incision into the muscles was made before lateral section was possible. The capsule and the gland itself seem to be entirely devoid of sensory endings. No more than the ordinary amount of bleeding was met with. One case suffered so much pain that the use of ether had to be resorted to and the operation was followed by hemorrhage, shock, and acute thyroid toxemia attributed to poor technique but the urine showed some albumin prior to operation.

Many herniotomies were performed with resort to a general anesthetic in only one instance and with but one failure in skin repair, due to the use of too large an amount of the solution. Isolation of the cord is unpleasant but is not extremely painful. Congenital types are best repaired under general anesthesia. Intra-abdominal work was unsuccessful due, it is supposed, to faulty technique. Two amputations of the tibia were successful but accompanied by some pain. The removal of growths from the extremities was satisfactory, as was also the removal of a carcinoma of the tongue, epitheliomata of the lip, a radical excision of the cervical glands, and an enchondroma of the sternum, but a radical breast operation failed.

E. K. Armstrong.

Savariaud: Prolonged Ethyl Chloride Anesthesia During Extensive Dressings. (*L'anesthésie prolongée au chlorure d'éthyle dans la pratique des grands pansements*). *Presse méd.*, 1916, p. 45.

Experience in war surgery has shown that the process of dressing is more painful and tedious than in peace time and that it is necessary at times to render the patient unconscious. Savariaud describes his method of using ethyl chloride by which he claims anesthesia may be prolonged for an hour. Recovery is rapid with this method. **A. Goss.**

SURGERY OF THE HEAD AND NECK

HEAD

Barnes, F. R., and Slocum, M. A.: Fracture of the Skull. *N. Y. M. J.*, 1916, CIII, 189.

Of 8 cases of fracture of the skull in which lumbar puncture was not done, all died but one; while of 19 cases in which puncture was done 18 recovered. The authors conclude that lumbar puncture should be done in every case of severe head injury, both for diagnosis and treatment, puncture being performed daily until recovery occurs. Trephining should not be done unless a definite indication presents itself, too much surgical interference being a mistake. The use of hexamethylenamine intraspinally is not attended by any harmful results but seems to be of little value in fracture of the skull. E. K. ARMSTRONG.

Mériel, E.: Fracture of the Base of the Skull; Early Double Subtemporal Trepanation; Recovery (Fracture de la base du crâne, double trépanation sous temporale précoce; guérison). *Bull. Soc. de chir., de Par.*, 1916, XLII, 48.

Mériel points out that early operative interference in fractures of the base of the skull is exceptional. The field is difficult to approach for cleansing and disinfection, and besides the dangers concomitant to operation are perhaps as great as those due to the lesion. Mériel differs from this view and reports a case to show that benefit can follow a simple and rapid operation even in cases which are considered beyond the resources of surgery.

In a very severe case of fracture of the vault irradiating to the base with hemorrhage from the nose and mouth, he practiced an early bilateral subtemporal trepanation, decompressing and draining the cranial cavity. The technique followed was that of Lejars. Immediate benefit resulted. The clonic convulsions ceased, circulation became regulated and the temperature approached normal. There was only slight subcutaneous suppuration. The man rapidly improved. Mériel advises the operation. Chudovsky in 1898 gave the mortality in non-operated cases of base fractures as 64.2 per cent. Cushing in operated cases had 13 recoveries in 15 cases and Vincent 7 recoveries in 7 operated cases. A. Goss.

Velter, M. E.: Immediate Treatment of Penetrating Skull Wounds (Le traitement d'urgence des plaies pénétrantes du crâne par projectiles de guerre). *Presse méd.*, 1916, p. 39.

Velter, basing his opinion on his own results and those published by others during the war, thinks that the treatment of penetrating skull wounds should follow these lines: (1) systematic trepanation of all wounds, whether penetration is doubtful or certain, (2) immediate operation, necessitating

intervention as soon as possible after inflation of the wound and consequently close to the firing line; (3) wide incisions to give plenty of room to explore fully; and extraction of all intracerebral projectiles, even the smallest pieces; (4) in closing, to drain as little as possible; where the operation is early there is less fear of infection; (5) precocity of systematic intervention in cranial wounds is the essential factor of success. A. Goss.

Morestin, H.: Reparation of Loss of Skull Substance, Particularly of the Face, by Cartilaginous Transplants (Réparation des pertes de substance du crâne et particulièrement du front à l'aide de transplants cartilagineux). *Bull. et mem. Soc. de chir., de Par.*, 1916, XLII, 333.

In a former report Morestin pointed out that cartilaginous transplants could be used in reparative surgery and showed by examples that loss of substance in the skull could be repaired by grafts of cartilaginous substance.

He now reports a number of other cases treated by this method. He thinks the procedure is a simple, easy, and sure one for the closure of even extensive cranial breaches; and is convinced that if others try it they will willingly adopt it, particularly for frontal breaches. Deformities resulting from the destruction of frontal parts and especially the orbital arcade are easily corrected by cartilaginous grafts; the results are very satisfactory and seem perfectly stable. The pieces of cartilage used by the author were obtained from subjects other than the one operated on. A. Goss.

Abadie: The Extraction of Intracranial Projectiles in Two Stages: Trepanation for Access After Radiographic Location; Extraction Under the Radioscopic Screen (L'ablation des projectiles intracrâniens en deux temps: trépanation d'accès après repérage radiographique; extraction sous l'écran radioscopique). *Bull. Soc. de chir. de Par.*, 1916, XLII, 3.

Abadie thinks that all intracranial projectiles should be removed as early as possible. Where the foreign body is very distant from the point of entry or anatomically placed in such a way that the point of entry cannot be used as an approach, he uses the following technique. He makes a trepanation at a point selected on account of its proximity to the projectile and also to the vessels and other structures. The dura is opened sufficiently to permit the introduction of a forceps, and the wound is temporarily dressed. On the next day or the day following, extraction of the projectile is carried out under the radioscopic screen, no anesthesia being necessary.

Abadie considers that his method of extraction, a day or two after the operatory incision, avoids many causes of possible infection, and reduces the

maneuvers of extraction to a minimum. Some cases thus treated have been entirely successful.

A. Goss.

Mayet. Restoration of Loss of Cranial Substance by Insertion of an Osteoperiosteal Flap Cut from the External Table of the Skull in the Vicinity (Restauration des pertes de substances crâniennes par rabattement d'un volet ostio-periostéotomique taillé aux dépens de la table externe d'une région du crâne contigüe). *Bull. Acad. de méd.*, 1916, lxxv, 137.

Many procedures have been attempted for the repair of extensive osseous breaches in the cranium, not only for the purpose of protecting the brain from injury, but also to prevent frequent hernias through the orifice. The method now reported seems to be new. It has been tried in three cases and appears more simple, more rapid, and surer than those now used.

In the cases reported the orifices were large, the diameter being at least 5 to 6 cm.

The procedure adopted consists essentially of inserting in the breach a section composed of periosteum and of the external table, the cranial wall in the vicinity being cut out and the section fitted to the edges of the breach, to the soft tissues of which it becomes adherent. The superficial periosteum comes in contact with the dura mater to which it grafts easily. It preserves its connections with the neighboring tissues by one of its edges and can be nourished through them. The graft is firmly held in its position by its soft parts and by tegumentary suturing.

A. Goss.

Climenko, H.: The Diagnosis of Brain Tumor. *N. Y. M. J.*, 1916, cii, 305.

Five cases are reported in order to illustrate some of the difficulties experienced in diagnosis. For a long time the first case showed only one symptom of intracranial pressure, convulsions. Finally all the symptoms of organic disease appeared with suddenness and were eventually shown to depend upon the presence of a glioma. In the second case the diagnosis was clear, the location definite, yet at operation no evidence of increased intracranial pressure and no tumor was found. Notwithstanding this, all symptoms except the hemianopsia and glycosuria disappeared. The third case shows that it is possible to diagnose, localize, and remove a brain tumor; for that patient, after removal of a portion of a glioma, is practically well today. The fourth case had all the general symptoms of increased intracranial pressure with syphilis and nephritis clinically excluded, but no tumor was found at autopsy. In the last case also no tumor was found to account for the findings.

The conclusion is that a diagnosis of brain tumor should be made with the utmost care, as any symptom may be utilized for or against a given diagnosis. What is regarded as a functional symptom may prove to be due to a tumor and the

statement is made that if convulsions begin first at or after middle age the diagnosis of epilepsy should not be made. Every such case sooner or later reveals its organic character.

Some cases of brain tumor can be cured and most of them relieved of distressing symptoms, but only those in cases where the localization is correctly made and where the tumor is in an accessible area of the brain.

E. K. ARMSTRONG.

Simmonds, M.: Cachexia of Hypophyseal Origin (Ueber Cachexie hypophysären Ursprungs). *Deutsche med. Wochenschr.*, 1916, xlii, 190.

About two years ago Simmonds reported a case of fatal cachexia which autopsy showed was due to destruction of the hypophysis cerebri. He now reports two additional cases. He thinks that there are cases of progressive cachexia in which no other anatomic peculiarity can be found except this destruction of the hypophysis; and that such cases must be regarded therefore as of hypophyseal origin. In the treatment of cachexia the origin of which is not clinically clear hypophyseal preparations should be tried.

W. A. BRIDGES.

NECK

Kirmlison: Congenital Torticollis (Torticollis congenital). *Rev. gén. de clin. et de thérap.*, 1916, xiv, 129.

Torticollis is always accompanied by atrophy on the side attacked. The consideration of this atrophy is of much importance to the surgeon who does not desire to expose himself to much unjust reproach. When the diagnosis of torticollis is certain complete recovery without a very grave operation can be expected. But although the operation has a sure effect on the reposition of the head, it can have no effect on the facial atrophy. Hence it is necessary to warn parents that it is impossible to cause the disappearance of this atrophy or at least that it can only be corrected after a long time, if at all. It is also a reason why intervention should be early. Operation should be performed at the age of five to seven years rather than waiting until the age of twelve to thirteen years.

A. Goss.

O'Day, J. C.: Carbohydrate Tolerance in Hyperthyroidism. *Surg., Gynec. & Obst.*, 1916, xiv, 906.

The author describes cases in which the condition of hyperthyroidism was the cause of the carbohydrate tolerance being destroyed. His first case presented the classical symptoms of the two diseases, diabetes mellitus and exophthalmic goiter. Not suspecting that the glycosuria might be related to the coexisting Graves' disease, the latter was regarded as the lesser of the two evils and treatment directed entirely toward the former. A total restriction of carbohydrates was unavailing in securing sugar-free urine. While the percentage was reduced, the sugar content of the blood remained unchanged. The patient finally died in coma.

Before the second patient with the same syndrome was encountered, the author having acquired some experience with the boiling water injections of Porter, applied this method to his second case together with the usual dietary treatment of diabetes. The goiter was injected daily, about 60 minims of boiling water being used. In four days a carbohydrate tolerance was gained, increasing with each succeeding injection till, finally, with extirpation of the goiter, normal tolerance was completely restored.

Reference is made to the work of Sainton and Gastaud of Paris, and the statistics given by them show the frequency of diabetes in exophthalmic goiter as three in one hundred cases. Clinically, diabetes occurring in the course of Graves' disease is manifest in two ways: (1) as a temporary or slight glycosuria with the usual symptoms of diabetes only present in a trifling degree, (2) as a well-established condition, with all the characteristic symptoms present, the latter frequently even dominating the clinical picture as a whole. The possibility of the adrenals participating in such a glycosuria is considered, owing to the thyroïdo-adrenal origin of exophthalmic goiter as taught by the Vienna school. This teaching is based on the theory that a relation exists between the thyroid, pancreas, and chromaffin system.

The theory offers the explanation that by reason of a pancreatic and thyroïdo-adrenal antagonism, the disturbance of the pancreatic function might extend to complete suppression of glycogenesis. The second case is of special interest because the diabetes made its appearance one year prior to the enlarging of the thyroid gland and the presence of symptoms of exophthalmic goiter. Boiling water injections with subsequent extirpation of two-thirds of the gland restored the carbohydrate tolerance completely.

The author discusses briefly the glycosuria of hyperpituitarism, and closes by expressing the belief that the time is not far distant when many cases of diabetes will pass from the internist to the surgeon.

Dowd, C. N.: Goiter; An Analysis of One Hundred and Thirty-seven Cases. *J. Am. M. Ass.*, 1916, lxxv, 480.

This study has been carried on in an endeavor to find the best method of dealing with goiters. One hundred and thirty-seven cases were studied. The following deductions seem to be fair:

1. For non-toxic patients who suffer from pressure symptoms or from neck deformity, cyst enucleation or partial thyroidectomy are extremely satisfactory procedures. The symptoms are relieved and the likelihood of later toxicity is almost abolished.

2. For mildly toxic patients, operation is also very satisfactory. When the toxic symptoms develop in connection with pre-existing goiter, cure is almost certain. When they develop in the early

stages of thyroid hyperplasia, cure is usually obtained, but cannot be expected with the same confidence. The operation may be by partial thyroidectomy, cyst enucleation, artery ligation, or by boiling water injection, according to the peculiarities of the case.

3. The patients with advanced exophthalmic goiter present the most difficult problems. For their successful treatment many elements must be considered, including the complex nature of the ductless glands, their interdependence on each other and on nervous and chemical influences from other parts of the body, and the various therapeutic measures which interrupt this vicious chain of disturbance.

The hyperplastic thyroid gland seems to be the cause of many of the symptoms, and it is the organ most easily attacked in an effort to control these symptoms. The treatment consists largely in an endeavor to control its overactivity.

Rest is an important element in this treatment.

The injection of boiling water (Porter) has an undoubted influence and can be used for patients too ill for more radical measures.

The ligation of the thyroid arteries is often very beneficial and can be used in preparing patients for hemithyroidectomy or as a substitute for that procedure.

The excision of a part of the thyroid gland has been followed by so many satisfactory results that it must be considered our most reliable therapeutic measure.

The administration of drugs and animal extracts and the use of the roentgen ray may be beneficial.

The choice of these procedures should depend on the condition of the patient. If that choice is judicious, nearly all of these patients can be brought to a condition of marked improvement.

EDWARD L. CORNELL

Pfahler, G. E., and Zulick, J. D.: The Treatment of Exophthalmic Goiter (Basedow's or Graves' Disease). *Am. J. Roentgenol.*, 1916, iii, 63.

Pfahler and Zulick give an extended review of the literature of the etiology, thymic hyperplasia (complicating), application of rays to ovaries in exophthalmic goiter, and theory of effects of roentgentherapy.

The authors' roentgenograph all cases at the beginning of the treatment for diagnosis of projection into the thorax and thymus enlargement and for subsequent estimation of progress.

As to the division of areas, when the thymus is not found enlarged by roentgenogram, they believe that a single dose directed through the sternum will be sufficient. When it is enlarged, the rays should be passed through two fields, one on either side of the median line below the clavicles and including the first, second, and third interspaces. When the goiter is not large and the Basedow symptoms are not marked, it will probably suffice to treat the thyroid through each side, making two

doses consisting upon the inferior of the gland. The treatment should not produce redness of the skin.

Each dose should be carefully measured and filtered and at no time should more than 20 X or double that "R" of the Sabouraud pastilles be extended in any particular area of skin.

The absurdity of a surgeon trying to direct the treatment by saying the patient shall be treated three times a week for a certain number of minutes can only be appreciated by those familiar with the factors that make up the total dose. The quantity of rays will vary with the time of the exposure, milliamperage, the degree of vacuum of the tube, and the distance of the target from the patient. Generally speaking, with a Coolidge tube, transformer current, a parallel spark gap of nine inches and the target of the tube eight inches from the skin, 5 milliamperes of current given for 3 minutes through 1 millimeter of aluminum and one layer of sole leather, will give 18 to 20 X, or approximately double that "R," and this is the dose the authors generally give.

The doses should not be repeated inside of three or four weeks, and the authors generally repeat once in four weeks. After there is a distinct improvement in the symptoms, the interval should be prolonged, for there is danger of reducing the secretion of the gland so as to have the symptoms of hypothyroidism instead of hyperthyroidism.

The authors' conclusions are:

1. That the trial of treatment for one series with an interval of waiting for one month is justifiable in all cases, for if operation is decided upon nothing is lost, and many operations in this way can be avoided.

2. Treatment should be directed toward both the thyroid and the thymus glands.

3. An increase in weight and a decrease in pulse are the first signs of improvement and are practically always found.

4. Treatment must not be prolonged over too great a period or hypothyroidism may be produced.

5. The goiter and the exophthalmos are the last to show improvement, and in many cases show no change.

DAVID K. BOWEN.

Baaling, H. R.: The Control of Experimental Cretinism. *Arch. Int. Med.* 1916, 172, 200.

The work reported in this paper was undertaken by the author primarily for the purpose of establishing a biological test for the active principle of the thyroid gland in the blood.

The experiments were carried out on cretin rabbits and five lines of investigation were undertaken: (1) the transfusion of normal blood serum; (2) the transfusion of "hyperthyroid" blood serum; (3) the feeding of standard U. S. P. thyroid products; (4) the feeding of Koch's thyroid metaprotein; (5) the feeding of Kendall's extract B.

The author gives in detail the methods of carrying out the various experiments, and from his study the following summary may be made:

1. Transfusion of normal blood serum into cretins has no effect on the condition of cretinism.

2. Transfusion of "hyperthyroid" (thyroid-fed animal's) blood serum into cretins is effective in increasing the growth and in controlling the other symptoms of cretinism. The improvement, however, is not so marked as with the thyroid feeding.

3. Standard thyroid preparations (containing 0.2 per cent iodine in organic combination), when given in carefully controlled non-toxic doses, will increase the growth of cretin rabbits and prevent the development of, or counteract, the other symptoms of cretinism; but thyroid feeding fails to carry an absolute cretin to full normal stature. Discontinuing the thyroid feeding leads to a return of some of the cretin symptoms.

4. The thyroid metaprotein of Koch is somewhat more active than standard thyroid preparations, but also more toxic.

5. Kendall's thyroid extract B has no effect on any of the symptoms of cretinism. It is non-toxic at least in ordinary doses.

6. Cretins are more susceptible than normal animals to the toxic action of thyroid (thyroid feeding).

7. Cretin rabbits, despite their retarded rate of growth, continue to grow for a considerably longer time (four to six weeks) than the controls of the same litter.

LEONARD E. BRIDGES.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Bloodgood, J. C.: Cancer of the Breast: Figures Which Show That Education Can Increase the Number of Cures. *J. Am. M. Ass.* 1916, lvi, 111.

A study of 1,577 cases of tumor of the breast, completed December 22, 1915, shows that cancer is on the decrease, and benign lesions of the breast are appearing more frequently in the surgical clinic at Johns Hopkins Hospital. The figures are so favorable that it seems almost just to state that

education of women and of the profession can result in the elimination of cancer of the breast.

From 1889 to 1900 the percentage of benign lesions was 34; from 1900 to 1910, 41; from 1910 to 1915, 47; and from 1911 to 1915, 50, or from 1900 to 1915, the percentage was 34. That is, in 6 years, as compared with the previous 10, the percentage has increased 13 per cent. But in the past 5 years it has increased 12 per cent over the previous 3 years.

Adenocarcinoma and cancer with areas of adenocarcinoma are distinctly on the increase, but only

certain types, namely, those which develop with a short duration of the disease. Adenocarcinoma developing in pre-existing tumors of one or more years' duration have decreased since 1910, while the benign tumors in which they may develop have increased. The percentage of adenocarcinoma from 1889 to 1910 was 10, while since 1913 it has increased to 22 per cent. Fully developed cancer of the breast has decreased from 90 per cent during the years 1889 to 1900 to 78 per cent since 1913. Since 1910 there have been 13 examples of benign cystic adenoma with only 1 of malignant. Apparently the women have reported earlier while the lesion was yet benign. Galactoceles are on the increase. Whether there is a probability that galactoceles disappear spontaneously and are recognized because of the earlier reporting to the physician, or whether they may develop into carcinoma is not determined. Of malignant papillomatous cysts, previous to 1910 there were 18 cases, since 1910, only 6 cases. Colloidal cancer is apparently on the decrease.

Adenocarcinoma of the duct type is on the increase. Previous to 1910 there were 16 cases, since 1910, 7 cases. The author is under the impression that this duct cancer, when it has been present some time, changes to a medullary carcinoma. The type of adenocarcinoma in which there is the greatest increase is the type in which there is developed the so-called chronic cystic mastitis of the adenocystic type. Previous to 1910, 11 cases were reported, since 1910, 15 cases.

There seems no doubt that adenocarcinoma of certain types is increasing, also mixed adenocarcinoma and cancer, while the fully developed scirrhous, medullary, and cancer-cyst type are on the decrease. Chronic cystic mastitis, not associated with lactation, appearing as a circumscribed tumor shows a marked increase. In the first 20 years there were only 11 cases, while during the last 6 years there have been 14. Chronic cystic mastitis, with development of large simple cysts, shows a great increase. In the first 20 years 95 cases were reported; in the past 6, 85, of which 45 have been observed since 1913.

The author's evidence shows that chronic cystic mastitis with large cysts has a tendency to disappear spontaneously. The benign form of chronic cystic mastitis, without large cysts, the adenocystic type, is on the increase; 20 cases were reported in the first 20 years, and 33 cases in the past 6 years. Observers state that malignancy is found in 50 per cent of the cases. Since 1913 the percentage of malignant cases in the chronic cystic mastitis type has decreased to 30 per cent. We have here evidence that cancer in the adenocystic type of chronic cystic mastitis is an early form of cancer, and that if patients submit to operation at an earlier period the probabilities are that cancer will not be found, and the percentage of cures will increase from 92 to 100 per cent. It is evident that patients are seeking advice much earlier since 1913.

It is very gratifying to find that the educational propaganda to combat cancer by seeking advice early is bearing fruit. The difficulties for the surgeon in making a diagnosis in cases of early breast tumor are proportionately increased. Greater dependence is daily put upon the gross appearance of the tumor at operation, as well as the frozen section. In a certain percentage of cases of the borderline type, where diagnosis even by aid of the frozen section is most difficult, it is wise to do the radical operation. It is the author's opinion that in from 10 to 20 per cent of such cases an unnecessary complete dissection will be made on the supposition that the benign lesion might be malignant.

HARRY G. SUGAR

Cole, H. P.: Radical Amputation of the Breast Under Local Anesthesia. *Surg. Gynec. & Obst.* 1916, xxi, 246.

Cole reports his experience with radical removal of the breast with axillary dissection under local anesthesia after the method of Braun.

He reports a case of an aged patient suffering with nephritis in which he first made a brachial plexus injection, using 10 ccm. of a 2 per cent novocaine adrenalin solution. He next produced conduction anesthesia by injecting 5 ccm. of a 1 per cent solution about the first eight dorsal nerves. Then with a local infiltration of a 0.5 per cent solution he blocks the supraclavicular branches along the clavicle and the overlapping innervation from the opposite side of the chest along the sternum.

An extensive dissection was carried out lasting over an hour and forty-five minutes, the patient experiencing no pain nor shock. He concludes that the ease and safety of operating with this method warrants its application in cases offering anesthesia complications.

TRACHEA AND LUNGS

Nilson, G.: Metapneumonic Empyema and Its Treatment (*Zur Kenntnis des metapneumonischen Empyems und dessen Behandlung*). *Acta med. Ark.* Stockholm, 1916, *Kirurgi*, Part 1, No. 5.

The author considers it an established fact that in children empyemas not uncommonly heal after thoracentesis alone. The size of the empyema cavity, as well as the character of the exudate, plays an important part. Nilson states that in some cases of a thin pleural effusion with sediment, he has tried thoracentesis, and has seen these patients healed after one single puncture. He questions whether these borderline cases should not rather be classified as seropurulent pleurisy than as empyema.

If the pus is thick and contains fibrin and amounts to more than one liter in adults, the author's experience has shown that real cure has never been effected by thoracentesis, and in such cases rib resection has to be resorted to. In his own cases the author has employed the primary resection of ribs in fully

developed empyema, with good results in all such cases.

Nilson reports his cases treated at the hospital in Karlskrona during the period from 1903 to 1915. Of 485 cases of acute pneumonia there were 32 cases of empyema, or 6.6 per cent. There were 3 deaths, a mortality of 9.3 per cent, as compared with a mortality of 21 per cent reported by Borchius. Nilson disagrees with the common idea that empyema is progressively a fairly harmless complication, and expresses the view that the presence of empyema often seems to be the expression of a highly virulent infection. In his operative technique he found that the best results were obtained by resorting to that rib which in the sitting or half-sitting position of the patient corresponds to the lowest point of the pleural cavity. A piece about 10 or 12 cm. was resected.

The author lays especial stress upon the fact that in all his 27 cured cases the results were accomplished without any secondary thoracoplastic operation being necessary to secure the best possible lung function.

W. A. BRUNNAN.

HEART AND VASCULAR SYSTEM

Conteaud and Bellot: Extraction of a Bullet from the Right Lobe of the Heart. (*Extraction d'une balle dans l'oreillette droite du cœur.*) *Rev. de chir.*, 1915, xxxiv, 433.

Medical literature contains few observations of intracardial foreign bodies successfully removed, owing to the danger and difficulty of access. Moreover in these few cases the end-results are not stated.

The authors report the case of a patient who received a penetrating gunshot wound in the breast in the right subclavicular region March 14, 1915. By the end of June the entry wound was cicatrized

but retrosternal pain and fever continued and the patient's condition continued very unsatisfactory. Radioscopic examination during the latter part of September disclosed a bullet embedded in the right segment of the cardiac mass. Surgical intervention was not attempted until November 9. The sternum was sectioned horizontally. The pleura in the neighborhood of the cicatrice was found badly torn and could not be sutured, pneumothorax resulting. On opening the pericardium the two layers were found totally adherent with no free space. The right anterolateral face of the heart was stripped by the finger, and pushing into the profundity the bullet was found embedded just above the outlet of the inferior vena cava, and extracted. The condition of the patient was very precarious, still the respiration though weak was sufficient, and at no time was there a stoppage of the heart action. Hemorrhage was controlled by clamps; the torn lobe and pericardium were sutured; and after tamponage, hemostasis was perfect. There was a comparatively slight loss of blood. Following operation the condition of the patient was very fair and the pulse improved until the second day. He died November 11. Autopsy showed no signs of hemorrhage either in the pleura or pericardium.

The authors discuss the conditions under which surgical intervention in such cases is permissible and the chances of success.

A. Goss.

Coleman, W. J.: Incised Wound of Heart; Suture and Recovery. *Maryland M. J.*, 1916, lxi, 42.

The author reports a case of razor wound of the chest opening the left pleural cavity, the pericardium, and heart. Closure of the ventricular wound with three catgut sutures and the institution of drainage resulted in recovery.

WALTER M. BOOTHBY.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Hookman, M. R.: Common Abdominal Crises. *N. Y. M. J.*, 1916, ciii, 276.

The author regards pain as a symptom of cardinal value, especially as regards its chronology, periodicity, onset, and character. The differentiation between involuntary muscular rigidity and voluntary muscular spasm is emphasized. In gall-stone disease the attacks of acute pain intermittent with periods of gastric distress, together with the shoulder radiation and renal localization are clearly detailed. A sign the author finds of value is hooking the finger in the umbilicus and causing traction to be made downward in the direction of the pulses, whereby traction is exerted upon the round ligament of the liver causing a rotation of liver bulk, resulting in referred pain over the gall-bladder region. In performing gastroduodenal ulcer the patient's posture is

fixed and quiet with little or no abdominal movement. The early rigidity of the upper abdomen with intense epigastric pain should arouse suspicion.

Acute appendicitis is represented as having the usual sequence of symptoms, as pain, nausea with or without vomiting, abdominal sensibility, rise of temperature, together with the ability of the patient to localize the point of maximum tenderness. Diet's crisis must be considered and is usually eliminated by the enteroptotic habitus of the patient and by the history of similar disturbances. Renal or ureteral calculus very often simulates an abdominal crisis and as vomiting is frequently the initial symptom (coming on especially after a meal) it might obscure the diagnosis. Physical examination is unsatisfactory as the patient cannot remain quiet long enough to permit a thorough examination. This in itself is a suspicious sign. Murphy's hammer percussion is of undoubted value together with

variations in the usual urinary history. Pelvic inflammation is sometimes confused with the above types of abdominal crises and it is frequently overlooked by reason of the attempt on the part of the patient to deceive the surgeon. The necessity for vaginal and rectal examinations in all cases is emphasized.

C. G. HEYD.

Hays, G. L.: Gunshot Wounds of the Abdominal Cavity. *Surg., Gynec. & Obst.*, 1916, xlii, 176.

Naturally all cases demanding exploration of the abdominal cavity are of serious import. Hays reports in detail 18 cases of gunshot wounds of the abdominal cavity with a general recovery of 61.11 per cent. Of the total 18 cases, 13 had perforations of the hollow viscera with 7 recoveries, 53.84 per cent.

Perforations occurred in all portions of the intestinal tract from the stomach to the sigmoid inclusive, except the duodenum. The greatest number of perforations in any one case was 16. The time of operation after injury in those cases which recovered was from two to twelve hours, the average time being five and one-half hours. Those terminating fatally were operated upon from seven to fifty-seven hours after the injury, the average being seventeen hours.

The symptoms are usually quite frank, but the presence of a wound of entrance alone demands exploration.

The treatment is entirely operative. Early cases require closure of perforations and introduction of drainage. Extensive injury to the bowel itself or to its mesentery occasionally requires resection. Entero-enterostomy has been found of great value where closure of perforations in the small bowel results in partial or complete occlusion of the lumen. An artificial anus can be established and is valuable where operation is late and peritonitis advanced. The method followed in closing perforations was to appose the edges of the perforation with through-and-through silk suture, protecting with Lembert suture of the same material.

Numerous complications occur following these injuries. Shock comes first. Peritonitis is always present. Threatened obstruction of the bowel and acute dilatation of the stomach should be kept in mind. Russian oil in good-sized doses with enemata at regular intervals has given good results in the former condition; lavage instituted early and repeated is the procedure in the latter.

Tisserand, G.: Why, How, and Where to Intervene in Abdominal Wounds (*Pourquoi, comment et où faut-il intervenir dans les plaies de l'abdomen*). *Lyon chir.*, 1916, xli, 701.

Tisserand's experience with abdominal wounds in war leads him to the following conclusions:

1. Almost all if not all true abdominal wounds have a fatal termination if they are not operated upon; surgical intervention can save a certain percentage.

2. The classes of abdominal lesions which may recover without surgical intervention are: (1) those in which there is no true perforation, cases in which the projectile has not traversed the totality of the wall, but is arrested in the immediate vicinity of the peritoneum; (2) wounds without visceral or vascular lesion; (3) lesions with only slight hemorrhage.

Wounds of the abdomen ought to be mobilized as early as possible, and near the place where they occur if there are signs of grave internal hemorrhage or perforation of an important viscera, immediate laparotomy is indicated. In grave visceral wounds, Murphy's operation is insufficient and in slight wounds it is useless. An absolute method of treating such wounds cannot be determined. The conditions require that secure and adequately equipped shelters for such wounded must be provided close to the firing line. Types of such shelters in actual use are described and many illustrative cases cited.

A. Goss.

Vignard, P.: Operative Indications in Penetrating Wounds of the Abdomen (*Essai sur les indications opératoires dans les plaies pénétrantes de l'abdomen*). *Lyon chir.*, 1916, xli, 721.

Vignard has observed 20 penetrating abdominal wounds. Of these 9 were operated upon, and 5 died; of the 11 which were not operated upon 3 died. Vignard's experience is that an intestine even with multiperforations does not easily empty its contents into the peritoneal cavity, and that in such lesions hemorrhage is the principal danger; moreover, that death does not usually follow till at least twenty-four hours after the wound is received giving sufficient time for transportation to a point where operation can be performed deliberately. While, therefore, generally ranging himself with those who favor intervention yet he cannot agree with those who think that in every case such intervention ought to be made on the firing line. Apart from the operation itself, the wounded under such circumstances would be in the worst possible conditions.

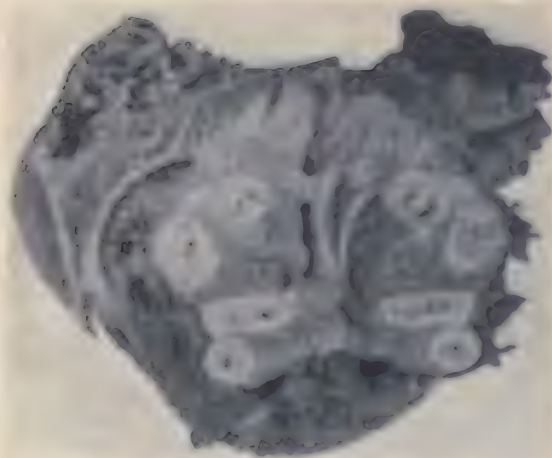
A. Goss.

Hadley, M. N.: The Origin of Retroperitoneal Cystic Tumors. *Surg., Gynec. & Obst.*, 1916, xlii, 174.

The origin of retroperitoneal cystic tumors has been the subject of much speculation and it is probable that the group of tumors generally classed as chyle cysts of the abdomen do not all have the same genesis. The tumors which occur in the mesentery and have an epithelial lining are clearly not of the same origin as those under discussion.

The close similarity in the contents and character of the wall which exists between the cystic tumors occurring in the lateral regions of the neck, and known as hygroma or hydrocele of the neck, and retroperitoneal cystic tumors suggests a common origin.

The embryological development of the lymphatic system offers a suggestion as to the origin of these two groups of tumors. This development is divided



A median section of the tumor. (Barlato and Olivieri.)

into two stages. The primary stage consists of the development of a series of isolated lymph-sacs which are clearly derived from the veins, and which later become united by the thoracic duct. The secondary stage involves the peripheral growth of lymphatic vessels which sprout out from the endothelial lining of these sacs and spread over the body.

These primitive lymph-sacs are four in number: the jugular sacs located in the neck; the retroperitoneal sac in the abdomen opposite the lower dorsal and upper lumbar vertebrae; and the posterior sac in the pelvis.

If the development of a particular lymph-node were arrested at a stage when it was still a plexus we would have the basis for the development of a future cyst.

Barlato, P., and Olivieri, E.: A Case of Hernial Peritonitis (Un caso de peritonitis herniaria). *Procesos med.*, Argentina, 1916, 11, 321.

The following case the author considers rare. A married woman, 50 years old, presented a large tumor in the hypogastric region to the left of the median line, where there was also found a cicatrix resulting from a former operation. The tumor followed an ascending line extending toward the hypochondrium of the same side. It was irreducible, smooth, very resistant, moveable towards the abdominal parietes, non-adherent to the skin, dull on percussion, on palpation extremely painful to the patient, no pedicle could be detected, indicating its penetration into the abdomen. With the aid of a local anesthetic, due to the patient's precarious condition, the tumor was dissected with much ease, and it was noticed that at the median line it had a narrow pedicle which entered the abdomen. On opening the sac at this point, it was found to be penetrated by the small intestine, and penetrating further, it was found that the intestine was attached

to the fluctuating part of the tumor, giving out a large quantity of purulent fluid, attached to the parietes of the cavity and the intestinal mass there was also found a cavity filled with adhesions and fibrinous exudate. A general anesthetic was administered, and the entire hernial tumor was resected, making a terminal anastomosis. The bowels began to evacuate the day following the operation until the seventh day, when the patient died of cardiac collapse. The patient, when 14 years old, had had typhoid fever, and an eventration had been performed when she was 41 years old. The present condition developed one year prior to the author's examination, and at that time she had pains in the belt line, especially the lumbar region; pains in the precordium, accompanied by palpitation, fatigue, and great oedema of the lower extremities. Before being admitted to the hospital, she had been unconscious for an hour and a half. Her pulse was 88; the second pulmonic sound accentuated. The tumor had been steadily increasing in size for 12 years, until it had reached the size of a human head. The patient suffered also from a suppurating parotitis. Radial and triceps reflexes were absent; Wassermann and Landau both positive.

A median section of the tumor is shown in the accompanying illustration. The intestinal portions were all in one mass. A quantity of fibroadipose tissue can also be seen. The tumor after being placed in formaline, looked like a solid tumor or a fibroma. Microscopically nothing of importance was found, except the inflammatory exudate, partly purulent, partly fibrinous. The preliminary diagnosis made was that of an intrasacral hernial tumor. By exclusion, eliminating etiologic factors, such as appendicitis, perforation of the intestine by foreign bodies as in the cases of Petit and of Sloker, etc., the final definite, diagnosis made, was that of hernial peritonitis, the suppurating substance having been probably due to a metastasis from the suppurating parotitis.

RACEL L. VIGAN.

Ruiz, J.: Congenital Lumbar or Costo-Iliac Hernia (Hernia lumbar, or costo-iliaca, congenita). *Gac. med. de Caracas*, 1915, XIII, 170.

This form of hernia the author considers extremely rare. Tillaux in his "Topographical Anatomy" cites Larrey's collection of only 25 observations.

The child Ruiz describes was 46 days old, born at term, without any accidents during pregnancy or labor. The child suffered from a left-sided hydrocele, at the same level with the lumbar hernia. The pulse was 140; respirations 40 to 50; temperature normal; tension of the large fontanelle normal. The family history was negative.

The majority of lumbar hernias occur in the superior lumbar triangle, reaching by continuity the inferior triangle of Petit, which is located between the sacrolumbar mass and the posterior border of the oblique maximus, a space less resistant than the rest of the parietes. The author excluded the possibility of a strangulated lumbar hernia for the con-

dilation is so rare that the literature records only one case, that of Ravaton, who in 1758 operated on a pregnant woman who suffered from many complications, due to a strangulated lumbar hernia, which was completely cured by the operation.

As to the treatment, the author thinks that a good elastic truss, such as is used in umbilical or inguinal hernias, well applied, is the best. A radical surgical interference in the case cited was not considered advisable, as the child was under three years of age and there was no sign of strangulation.

RAOUL L. VIDUAN.

GASTRO-INTESTINAL TRACT

Maiolo, B.: Occult Hæmorrhage of the Digestive Canal (*Sulle emorragie occulte del canale digerente*). *Pubblicin*, Roma, 1916, XIII, 1.

The presence of small quantities of blood in the gastric contents or feces has been found in the last few years to be of the greatest importance in the diagnosis of certain gastric and intestinal diseases. It has been demonstrated in many morbid conditions, such as intestinal tuberculosis, typhoid, dochmiasis, anemia, and hemorrhagic diathesis. The author reviews the salient features of Ewald's and Boas' experimentations on the value of occult hæmorrhages in the diagnosis of diseases of the digestive tract; notes the value of aloin, indicated by Klunge; Schar and Rossel; diphenylamine of Storch; phenolphthalein of Meyer and recommended by Boas. After considering the question of the blood pigment of alimentary origin (exogenous), influencing Adler's and Boas' reaction, from the standpoint of his own experimentation and from observations gathered from others, he presents the following conclusions:

1. The clinical importance of occult hæmorrhage in the feces and the gastric contents is in proportion to the reaction employed for its detection.

2. The only valuable results are those obtained by a catalytic proof; a negative result does not exclude the existence of minimal traces of blood.

3. Clinical proofs which must be resorted to, preceded by spectroscopic and microcrystalographic proofs, are exclusively the proofs of the benzin and phenolphthalein reactions of Boas.

4. These two reactions are determinants of the quantity of blood as well.

5. The two reactions are not always necessary but advisable in doubtful cases, to enable one to express an opinion of great clinical importance.

RAOUL L. VIDUAN.

Koehler, G. F., and Walker, R. C.: A Clinical Study of Gastric and Duodenal Ulcer. *North-west Med.*, 1916, XV, 58.

The author makes three classifications: (1) medical ulcer, in which relief by medical treatment is usually prompt and lasting; (2) chronic ulcer, the borderline case in which the prognosis is often very uncertain, depending on the thoroughness of medical

treatment and the presence or absence of complications; (3) surgical ulcers, with recurring hæmorrhages or complicated by contraction deformities of the stomach.

Pain is the most constant clinical symptom of ulcer. Pain in duodenal ulcer is not so acute as in gastric and remissions of several weeks are the rule. Hunger pains and pains coming on four hours after ingestion of food are characteristic. Pain that wakes the patient up after midnight is characteristic of duodenal ulcer. In gastric ulcer pain is usually increased by the intake of food. Soda relieves it. Pain is localized in a small area in the pit of the stomach, going through to the back. Gastric ulcer pain is apt to be aggravated by exercise. The pain of chronic appendicitis is not so intense nor is it so definitely associated with the taking of food. In biliary colic, the patient usually can eat the coarsest diet without discomfort. Duration of pain does not correspond to that of gastric digestion. Local tenderness of the gall-bladder or of the liver is never absent when a calculus or inflammation is present. Finding of visible or occult blood in the stool is a valuable aid in the diagnosis between gall-bladder disease and ulcer.

Small ulcers may not be demonstrable by the X-ray, but where the crater is sufficiently well marked they are easily discernible by this means. Co-operation between the internist and X-ray man will give a positive diagnosis in a case of ulcer in from 80 to 90 per cent of cases.

It is the author's opinion that every chronic, bleeding ulcer is a pre-cancerous lesion and must be dealt with accordingly. It is a cancer in the operable and curable stage, potentially, and excision is the only remedy. Periodic occurrences of abdominal pain, with intermittent motor insufficiency, produced by a reflex spasm of the pylorus, is almost pathognomonic of duodenal ulcer. When this recurring spasm is observed, notwithstanding the fact that the patient has received correct medical treatment, operation is advisable. Hyperacidity seems to be an essential factor in the production of ulcer of the stomach, but the pain is more likely to result from movements of the part of the stomach involved in the ulcerative process. Vomiting occurs in a large percentage of ulcer cases, appearing somewhat later than the pain, and in nearly every instance is followed by relief. In duodenal ulcer, vomiting is usually regular, except in complications, coming on one to four hours after meals. In gall-bladder disease, the vomiting is only at a crisis. In chronic appendicitis, vomiting is not so prominent a symptom as in ulcer, and does not afford the same degree of relief. Blood occurs in about 30 per cent of cases in the vomitus in gastric ulcer. Hæmorrhage due to malignant disease of the stomach is not commonly sudden and profuse. In acute ulcer the bleeding is more profuse and intermittent, whereas in the chronic type the amount is smaller and the bleeding more constant.

In medical treatment of acute ulcer, the author

advocates absolute rest in bed for three weeks. The diet he advocates consists of raw eggs beaten up whole, alternating with a small amount of cold milk. Small amounts are given of each. At the end of the first week the patient is taking 6 eggs and 14 ounces of milk, when boiled rice and soft boiled eggs are added. In the event of hemorrhage nothing is given by mouth, neither food nor medicine.

HARRY G. SEDAN.

Rasch, S.: Primary Benign Growths of the Stomach. *Surg., Gynec. & Obst.*, 1916, XLII, 165.

Little attention has been given to the study of benign growths of the stomach. Their discovery in most instances has been an operative or post-mortem surprise. A study of reported cases reveals a number of important clinical facts. The present paper considers only the genuine new-growths, including mucous polyp, adenomata, lymphadenomata, myomata, fibromata, lipomata, myxomata, osteomata, and cysts. These are briefly discussed in general and in detail individually. The symptomatology, diagnosis, prognosis, and treatment is next taken up and three observed cases are reported to illustrate more particularly the value of radiology in the diagnosis of these tumors.

Friedenwald, J.: The Early Recognition of Cancer of the Stomach. *Maryland M. J.*, 1916, IX, 27.

As a plea for earlier recognition and operation for cancer of the stomach, Friedenwald cites his own experience with 266 cases, none of which are living today. Frankness in regard to personal statistics is to be commended, but sufficient details should be given as to the length of life after operation, pathological conditions found, etc., to prevent a misunderstanding of the report. WALTER M. BOOTHBY.

McNeil, H. L.: The Use of the Duodenal Catheter in Diagnosis. *Amer. J. M. Sci.*, 1916, XL, 106.

Stimulated by the work of Einhorn, Chase, Crohn and Bondi and Salomon with the duodenal tube in diagnosis, the author has examined a number of cases using a technique differing materially from that ordinarily employed. By carefully avoiding the administration of tea, water, or any other substance he has been able to obtain a pure secretion in nearly every case. The so-called Jutte duodenal tube was found to be the most satisfactory. The contents removed were examined for the gross and microscopic appearance and chemically for free HCl, total acidity, lactic acid, Wolff-Jungman's test for dissolved albumin, and pancreatic ferments. The author examined 25 normal cases, finding rather constant pictures. The free HCl ranged from 0 to 30, the total acidity from a trace to 30, a fairly constant amount of mucus, a few gastric epithelial cells, and a fairly constant percentage of dissolved albumin.

The 12 cases of chronic gastritis which were studied rather constantly showed an excess of mucus, usually no free HCl, few cellular elements ex-

cept pus-cells, which were numerous, and a sluggish motility. The acute and subacute gastric cases showed a fairly high percentage of HCl, less mucus, and an increase in cellular elements. Hypersecretion was evidenced by a continuous watery, highly acid secretion, with free HCl varying from 60 to 80. Microscopically the contents were negative. In ulcer of the stomach and duodenum the results were disappointing, though red blood cells were recognizable. An ulcerative process was recognized by the pus-cells. In gastric carcinoma the picture was that of a chronic gastritis. Cells showing mitotic changes were not found often enough to be of value in diagnosis. Free HCl was entirely absent, while the total acidity was usually comparatively high. In three cases of duodenitis there was a considerable amount of mucus and numerous bacteria. In three of four cases of typhoid fever the bacilli were found in the bile. The absence of pancreatic ferments in the duodenal contents and stools permitted a diagnosis of carcinoma of the head of the pancreas.

Achylia pancreatica, acute cholecystitis, and atrophic cirrhosis of the liver were all studied, but the results while interesting were not conclusive. The author believes that the following conclusions are justified as a result of this work.

1. The direct method of study of the gastric and duodenal contents is of value in the diagnosis of acute and chronic gastritis, carcinoma ventriculi, acute ulcerations, pancreatitis, duodenitis, continuous hypersecretion, etc.

2. Further study of hepatic and biliary diseases may be of value.

3. The absence of pancreatic ferments in the duodenal contents is significant of obstruction of the pancreatic duct, especially valuable when associated with a marked diminution of diastase and trypsin in the stools.

4. The duodenal tube is the only means we possess of studying duodenitis.

5. The tube is of value in detecting typhoid carriers.

E. K. ARMSTRONG.

Jones, C. R.: Duodenal Feeding. *Surg., Gynec. & Obst.*, 1916, XLII, 149.

The duodenal tube as used by Einhorn and modified by Morgan furnishes nutrition and has advantages over rectal or stomach feeding. It is advantageously used in cases of gastric and duodenal ulcer, also in ptosis, atony, and dilatation of the stomach; the patients are comfortable, well nourished, and gain in weight during the duodenal feeding, which is only the beginning of the treatment when time is considered; special dietary and hygienic regimen should continue from varying periods after duodenal feeding has been discontinued.

In cases of extreme ptosis and hypomotility there is sometimes difficulty in getting the tube to pass the pylorus, but up to the present time in only one case has it failed to pass. There was some difficulty in removing the tube on account of spasm of the esophagus in one case.

The principal points in the technique are: Give 0.5 grain of codeine an hour before introducing the tube, repeat if necessary during the first 48 hours, begin feeding every two hours as soon as the tube is in place in the duodenum; increase the feedings gradually to 10 to 12 ounces, using milk, cream, and raw eggs, strained through four thicknesses of fine linen. One patient gained 25 lbs. in four weeks while taking no other food except through the duodenal tube.

In most instances the position of the stomach remained the same as before the treatment, while the patients were symptomatically well.

Bland-Sutton, J.: Ulcers New and Old: Jejunal or Duodenal Ulcers. *Lancet*, Lond., 1916, i, 387.

Bland-Sutton states that some of the most troublesome ulcers of the pyloric region can neither be seen nor felt in the course of a gastro-enterostomy. A small duodenal ulcer can easily be detected when it involves the peritoneum and produces a scar. These small ulcers cause paroxysmal pain and digestive discomfort, the symptoms of "a vext duodenum and an agitated pylorus." He refers to the great rarity of an ulcer in the duodenum becoming malignant and states that he has never observed one. He also speaks of the rarity of implantation cancer in the intestines above the ileocecal valve.

The ulcers which occasionally follow gastro-enterostomy are described as jejunal and in reviewing the symptoms of such an ulcer he refers to the similarity to the original complaint for which the patient was operated upon. He mentions two patients in which he had the opportunity of studying the changes in the jejunum which precede the formation of a jejunal ulcer. In one case, on opening the abdomen the white scar of the original ulcer in the duodenum was visible. The area of the stomach involved in the gastrojejunal junction adhered to the anterior abdominal wall, and on detaching it an irregular opening appeared in the efferent limb near the gastrojejunal junction. The segment of stomach and the cylinder of jejunum involved in the junction were cut away. The opening in the stomach was closed with silk sutures and the cut ends of the jejunum were joined end-to-end. The patient recovered easily and quickly. The changes that had taken place in the tissues of the jejunum adjacent to the new stoma were remarkable. Normally the mucous membrane of the jejunum is thick and thrown into folds, the familiar valvulae conniventes; but in this specimen the jejunal mucous membrane in the vicinity of the new stoma was thin, the valvulae were effaced, and the muscular coat was thin and transparent. The opening occupied the efferent limb of the jejunum just beyond the cicatrix marking the union of the stomach and gut.

There were no valvulae conniventes in the first 4 or 5 cm. of the duodenum, and its wall was thinner than in the remaining portion; it is often dilated and forms a bulbous duodeni. A remarkable transformation occurred in the jejunum when the

escape of chyme from the stomach was transferred, in consequence of gastro-jejunosomy, directly into the jejunum. The wall of the jejunum receiving the impact of chyme ejected through the new stoma became attenuated, the valvular disappeared, and the jejunal walls assumed the peculiarities of the supra-ampullary segment of the duodenum. This change entailed a liability to ulceration so common in the duodenum.

It is the common opinion that the duodenal ulcer is caused by the impinging of acid chyme ejected through the pylorus onto the wall of the duodenum. The features surrounding the origin of the jejunal ulcer following gastrojejunosomy seemed to support the percussion theory, but so far in discussions on the mode of origin of gastric and duodenal ulcers but little regard is paid to the influence of bacterial action. It is generally believed that the stomach is amicrobic as long as it can expel its contents, but observations on the fluid found in the abdominal cavity of patients with perforated gastric and duodenal ulcers prove that it often swarms with pathogenic micro-organisms, especially streptococci. These are introduced with food, and especially with milk, wittily described as "our most polluted article of diet."

The author briefly discusses the cause of these secondary ulcers. He does not believe that they are due to fault in technique or that the suture fails to completely control the bleeding with a resultant hæmatoma, and that there is very little evidence available for the incrimination of silk or linen threads.

He states that with an unobstructed pylorus, gastro-enterostomy cannot be relied on to cure a chronic duodenal ulcer and he has gradually abandoned it as a routine method and prefers to excise the pylorus and the segment of duodenum containing the ulcer.

The common form of dilated stomach, nicknamed "splashy stomach," and which was mainly responsible for bringing routine gastrojejunosomy into disrepute, is worth some attention; he believes it is caused in some cases by spasmodic closure of the pylorus. Just as the small painful ulcer or fissure of the anus leads to irritative action of the anal sphincter, often ending in dilatation of the rectum and the pelvic colon, so repeated spasmodic contraction of the pyloric sphincter will produce dilatation of the stomach. Convinced of this correlation of events the author has excised the pylorus in such cases with good consequences, but on the whole the conditions which gave the best results to this mode of treatment were those in which there was a gross lesion at the pylorus.

He then describes his technique for pylorotomy in these cases of duodenal ulcers and the contra-indications to the operation. In the majority of cases, he has made a direct anastomosis between the cut edges of the duodenum and stomach, using silk entirely. The only death which he had in some 30 cases, was in a case in which he had used catgut.

Since the treatment of duodenal ulcer passed into

the province of surgery it has become the routine practice to perform gastrojejunostomy for its relief in the hope that by diverting the chyme through the new stoma into the jejunum the ulcer would heal. If the pylorus was obstructed by the ulcer the results were usually good, because the chyme must pass through the new stoma, but when the pylorus was patent the chyme flowed through it and in some instances ignored the new route. The efflux could be watched with the help of an opaque meal and X-rays. He believes it is better whenever practicable to excise the pylorus with the ulcerated portion of the duodenum and rejoin the stomach and duodenum on the principle of an end-to-end anastomosis. If this method could be made safe, gastrojejunostomy for the relief of chronic duodenal ulcer with an unobstructed pylorus would soon be abandoned.

Experience has proved that posterior gastrojejunostomy with an obstructed pylorus is a beneficent operation, in spite of the risk the patient runs of getting a new ulcer for an old one.

D. C. BALFOUR.

Forgue, E. and Chauvin, E.: Primary and Intrinsic Cancer of the Duodenum (*Le cancer primitif et intrinsèque du duodénum*). *Rev. de chir.*, 1916, xxxiv, 470.

The authors present a very extensive study of this condition. They point out that it is more frequent than is generally considered since, according to Eichhorst, duodenal cancer represents 76 per cent of cancer of the small intestine. The history of the condition is given from the time Hamberger first described it in 1746 up to the contribution of Crowther in 1913.

A review of the reports of many authors shows that as regards occurrence, in 83,634 autopsies there were 6,847 cancers, 642 being intestinal. Of the latter 40, or 6 per cent, were of the small intestine. Statistics show that about 4.3 per cent of intestinal cancers are duodenal cancers.

The authors have collected from the literature 45 cases of non-ampullar cancer of the duodenum, of which 29 epithelial cancers were precisely located, also 17 supra-ampullar cancers, 11 subampullar, and 1 diffuse cancer. The 45 cases of non-ampullar cancer are described in full detail.

In differentiating between sarcoma and carcinoma the authors quote Nothnagel, who in 21,118 autopsies found 4 duodenal cancers and 6 of the duod. Of 116 sarcomata 3 only were intestinal, and of 61 lymphosarcomata 9 were duodenal. There is only one conjunctive tumor of the duodenum to three epithelial tumors.

From a consideration of available statistics the authors conclude that the small intestine is the elective site of sarcomata of the digestive tract, while epithelial cancers prefer the stomach and large intestine. When carcinoma occurs in the small intestine it localizes by preference in the duodenum and especially at the summit of Vater's ampulla.

In the series of cases from the literature cited by the authors there were 24 sarcomata and 28 carcinomata.

The etiology, pathological anatomy, symptoms, and evolution are considered at length. The prognosis is a chronic and fatally progressive evolution. Surgery is the only treatment. Only 11 of the 45 cases collected by the authors permitted surgical interference. Of these four were exploratory laparotomies. Four gastro-enterostomies gave 2 recoveries and 2 deaths. There were only 4 radical operations. The authors give the particulars of the latest technique.

A. Goss.

Verhaeghe: Penetrating Abdominal Wound with Multiple Perforations of the Small Intestine; Lateral Laparotomy; Recovery (*Plaie pénétrante de l'abdomen avec perforations multiples du grêle par ecclat de grenade; laparotomie latérale; guérison*). *Rev. gén. de clin. et de thérap.*, 1916, xxx, 128.

The interest in the case reported lies in the fact that a lateral laparotomy was performed, which sufficed to close and repair the different perforations with an excellent result.

Although in general a small lateral iliac incision does not allow sufficient light for surgical work, nor does it permit sufficient abdominal exploration, yet it avoids exposure to sepsis, and in cases where it is applicable, the advantages are sufficient to warrant its adoption.

A. Goss.

Quénu, E.: Repeated Invaginations of the Small Intestine; Congenital Absence of the Right Half of the Large Intestine (*Invagination à répétition du grêle; absence congénitale de la moitié droite du gros intestin*). *Bull. Soc. de chir., de Par.*, 1916, xlii, 355.

Gerner in 1907, investigating chronic invagination only from the surgical point of view, collected 195 observations. Quénu now calls attention to the forms of this condition which are slow in evolution and take years to produce a condition requiring intervention. He reports a typical case.

In some of these cases there may be a permanent invagination of the intestine; in others there is only a permanent tendency for invagination to be reproduced at clear and distinct intervals. Patients continue for years to experience digestive trouble resembling indigestion, sometimes with momentary stoppage of flatus and terminated by an onset of diarrhea. These symptoms occur in crises and at greater or less intervals, until at some severe crisis surgical intervention is necessary. The classic signs of acute invagination are: the bloody stools accompanying a painful paroxysm and a more or less complete stoppage of flatus.

In Quénu's case, after a preliminary operation and reduction of the invaginated intestine, a second crisis occurred, necessitating resection of the invaginated portion which in this case could not be reduced. The patient died on the seventh day of general weakness and especially, as the author

thinks, from intoxication provoked by the putrid fermentation of the stagnant blood in the intestine.

In such cases when a diagnosis can be made Ochsner thinks the most favorable time for operation is between the crises.

A. COSS.

MacKenzie, W. C.: The Biology of the Vermiform Appendix. *Lancet, Lond.*, 1916, *xxx*, 183.

The author has carried on research work in connection with the appendices of various animals. In Australia a group of animals has been found which adds a great deal of light to the evolution of the appendix.

The animals of one group have large appendices and live largely on vegetation. Another group shows the opposite extreme—the appendix having practically disappeared. However in none of these animals has the author discovered the slightest trace of inflammation in the region of the appendix. As to what causes appendicitis in the human diet, erect posture, environment, etc., no light has been thrown by the author's research.

J. H. SKILES.

Young, W. G.: An Unusual Case of Appendicitis. *J. Am. M. Ass.*, 1916, *lxvi*, 351.

At operation a large piece of gangrenous omentum was removed, as well as the appendix. The patient went from one crisis to another. General peritonitis set in thirty hours after appendectomy. A retrocæcal abscess was found ten days later. In four days an empyema began, which was complicated by liver infection. The patient recovered.

The gangrenous appendix in this case was clearly due to constriction by a Jackson membrane.

The technical difficulties encountered in its removal were due to its posterior situation and to its being buried beneath a pericolic membrane, plus an adherent cæcum.

The early drainage of the peritoneal cavity, which was done thirty hours after the primary operation when the abdomen was reopened on the advent of the general peritonitis, was probably responsible for the favorable outcome. A retrocæcal abscess was located and evacuated under local anesthesia. This was followed by pleural involvement, and infection of the liver. Prompt and radical treatment of the empyema and drainage of the abscessed liver through the transpleural-thoracic route was the procedure adopted.

In discussing this method of attacking an abscessed liver in such cases, Deaver says that this is the route of choice even in cases in which there is no empyema. He describes in detail the technique of drainage through the thorax transpleurally, and adds that only about 16 per cent of liver abscesses can be successfully handled through a laparotomy.

This case shows what can be accomplished by persistent and well-directed effort, even in the face of such desperate crises as were encountered, and also emphasizes the necessity for operation in all cases of appendicitis as soon as recognized.

EDWARD L. CORNELL.

Williams, R. B.: Three Hundred Twenty-four Consecutive Cases of Appendicitis Operated upon Without a Death. *Surg., Gynec. & Obst.*, 1916, *xxii*, 215.

In a period of four and one-half years, January, 1911 to July 1915, 324 consecutive cases of appendicitis have been operated upon at the Naval Hospital at Norfolk, Va., without a death. Of these cases 183 were acute and 141 were chronic, interval operation being included in the latter.

The majority of the acute cases reached the hospital early and of those cases in which transfer was delayed, the Ochsner treatment had been given and to this fact the absence of mortality is largely attributed. Immediate operation was done in all cases presenting acute symptoms. Gas-oxygen anesthesia was used in practically all of the cases and tincture of iodine was used to disinfect the skin. The McBurney incision was employed in all the acute cases, the incision being enlarged occasionally by opening the rectus sheath.

Of the 183 acute cases but 28 were drained, cigarette drains being used in practically all these cases. Drainage is being used much less frequently now than a few years ago, even in cases presenting considerable plastic exudate and moderate turbid fluid drainage is no longer employed.

In discussing the after-treatment, emphasis is laid upon the great benefit to be derived from repeated washing out of the stomach and the giving of repeated enemata in cases in which vomiting persists or in which peristalsis is slow in resuming its function. In all the severer cases and in every case in which drainage was used the sitting position of Fowler and the saline proctoclysis of Murphy were employed.

The recovery of the 183 consecutive acute cases is attributed by the author to the following factors: early diagnosis and early transfer to hospital in a large proportion of the cases; the avoidance of food, drink, and purgative, especially the latter (the Ochsner treatment) in those cases that could not be transferred early; and immediate operation in all cases presenting acute symptoms upon their arrival at the hospital.

The author recommends large right rectus incisions in all chronic cases with thorough exploration of the right iliac fossa and the region of the hepatic flexure to determine the presence or absence of adventitious bands and membranes of the Lane or Jackson type, which are now recognized as the etiological factors in the production of certain digestive disturbances heretofore diagnosed as chronic appendicitis.

Boughton, G. C.: Notes on the After-Treatment of Suppurative Appendicitis. *Am. J. Surg.*, 1916, *xxx*, 42.

The author states that the mortality in cases of appendicitis is much larger than it should be, and is due to the lack of proper after-care. He gives his own operative technique for those cases which have

been allowed to go on to the suppurating and gangrenous stage, outlines the after-treatment, and concludes by giving the cardinal points in the treatment of septic cases of appendicitis.

After the usual abdominal preparation, the patient is given morphine $\frac{1}{4}$ gr. and atropine $\frac{1}{200}$ gr. Under either the abdomen is opened in the median line, or by means of a low McBurney incision. The appendix is removed and two or three drains are placed in position, one going down into the abscess cavity near the stump of the appendix and one down into the pelvis. The wound is then partially closed, using chromicized catgut for the peritoneum. As soon as the patient returns to his room, he is given 8 oz. of saline solution per rectum and is placed in the true Fowler position. The saline solution is repeated in 6-oz. doses every two hours for three doses, then 4 oz. every three hours for the next ten or twelve hours. The first dressing is done forty-eight hours after the operation, and the drainage tubes are withdrawn a little to prevent pressure on or necrosis of any loop of the bowel that might come in contact with them. The pelvic drain is removed on about the fifth day.

Nothing is given by mouth for twenty-four hours; at the end of that time sips of water are allowed, and then, gradually, albumin water, chicken broth, and buttermilk.

Patients unable to expel gas are given eserine sulphate $\frac{1}{50}$ gr. and strychnine sulphate $\frac{1}{50}$ grs. hypodermatically every four hours, and with low soap-suds enemas. This treatment is continued until peristalsis is resumed.

The cardinal points in the treatment of septic cases of appendicitis are: as little handling of the bowels as possible, free drainage, the true Fowler position following operation, supervision of the first four or five dressings, morphine if needed, and the use of the stomach tube for dilatation.

R. H. KENNIS.

Bainbridge, W. S.: Chronic Intestinal Stasis: Report of Twelve Cases. *Am. J. Obst., N. Y.*, 1916, lxviii, 193.

The author discusses briefly the development of the surgical procedures for chronic intestinal cases, reports 12 cases which he has operated upon, and gives the following conclusions:

The condition and the resulting symptom-complex now described under the designation, chronic intestinal stasis, has been established through the lapse of time and the accumulation of experience. It is primarily, a condition which is amenable to dietetic, hygienic, and medicinal treatment, and should not, therefore, be so generally considered as coming entirely within the category of a surgical affliction. If, however, through neglect or improper treatment the individual case is no longer amenable to preventive measures and those which come within the province of the internist or gastro-enterologist, conservative surgical procedures may be employed, especially in milder cases. Unfortunately, many

cases progress to a more advanced stage before relief is definitely sought, and in such cases it may be necessary to resort to the more radical surgical procedures, such as ileocolostomy or colectomy.

The sequence of therapeutic intervention always to be kept in mind is: (1) prevention, (2) conservative surgery, (3) radical surgery. In all cases in which surgical treatment is employed, the after-care of the patient is of the utmost importance. Nature so long outraged, cannot justly be expected to resume normal function at once and without the aid furnished by regulated diet and habits of life, artificial support to the weakened abdominal muscles and viscera, and other measures suited to the needs of the individual.

From the cases cited, and many others in the author's experience and that of his *confrères*, there is reason to believe that chronic intestinal stasis plays an important part, either in initiating or augmenting many conditions which were formerly not associated, from the etiologic point of view, with perverted function of the gastro-intestinal tract. These far-reaching possibilities should be borne in mind by practitioners in every field of medicine and surgery.

C. H. DAVIS.

Fowler, R. H.: Persistent Developmental Anomalies of Position of the Large Intestine, with Especial Reference to the Ascending Colon and Cæcum. *Med. Rec.*, 1916, lxxviii, 353.

The author reviews the literature bearing upon this subject and reports the case of a male, aged 32, who had been ill for two days, his chief complaint being periumbilical cramps and vomiting with a temperature of 101.4° . Examination revealed rigidity and tenderness in the upper right quadrant of the abdomen. A diagnosis of appendicitis was made. At the operation the appendix was found to be adherent throughout its entire length to the posterior cecal wall, and was bulbous at its end and constricted at its middle. There was complete non-descent of the cæcum with total absence of the ascending colon.

The author reports three other cases which occurred in the practice of other physicians. He believes that this condition frequently explains atypical abdominal symptoms referable to the appendix and other left-sided inflammatory conditions.

GEORGE E. BELLAY.

LIVER, PANCREAS, AND SPLEEN

Jeger, E.: Operative Treatment of Ascites in Cirrhosis of the Liver (*Zur operativen Behandlung des Ascites bei Lebercirrhose*). *Beitr. z. klin. Chir.*, 1916, xliii, 94.

In 1911-12 the author demonstrated a new and simplified method of side-to-side anastomosis between blood-vessels without interruption of the blood stream during the operation, especially between the portal vein and the inferior vena cava, and pointed out that this procedure might be util-

ized, as had already been pointed out by other surgeons, as a means of draining the blood from the portal vein in cases of ascites due to stasis of the portal vein from cirrhosis of the liver or other causes. Former methods of vessel suture have been much too complicated for this purpose. The author also reported a series of experiments on dogs which had convinced him that such an anastomosis was not followed by any injury to the organism.

A year later Rosenstein reported the actual performance of such an anastomosis between the vena cava and portal vein in a woman with cirrhosis of the liver. The operation only brought temporary success, probably because of secondary obliteration of the anastomosis, which had been performed without proper instruments. So far as is known no further attempts had been made at this operation. The reasons for this are evident. The portal vein is so inaccessible to operation in man, that even with this very simple technique it offers extraordinary technical difficulties. Even on normal corpses a sufficient exposure of the portal vein and the corresponding portion of the vena cava is possible only after a very large abdominal incision, and besides it is necessary to resect the lowest ribs and rib cartilages in order to luxate the liver upward sufficiently. Such an operation, as a rule, could not be performed on patients with lowered vitality. Moreover in operative cases the liver is generally so enlarged or adherent to the surrounding tissues that anastomosis between the vena cava and portal vein would be impossible.

At the German Congress of Surgery in 1911 Bier reported that he had twice attempted an anastomosis between the vena cava and portal vein, but had been prevented both times by extremely strong, bleeding adhesions. Kocher in his *Operationslehre* designates the operation as practically unthinkable. The author was obliged to acknowledge the objections brought against this form of anastomosis and followed Villard and Tavenier's proposal to make an anastomosis between a branch of the superior mesenteric and ovarian veins instead of the portal vein and the vena cava. He now proposes a procedure which has the advantages of sufficient drainage of the portal blood into the lower vena cava and of easy operability. This is an anastomosis of the vena cava with the main branch of the superior mesenteric vein, at the lower margin of the pars horizontalis inferior and the pars ascendens of the duodenum. As the lower vena cava and the main branch of the superior mesenteric vein have no valves the same result is to be expected as in an anastomosis of the inferior vena cava with the main branch of the portal vein.

The technique of the operation, which the author studied on 20 corpses, is as follows: Position on back on high pillow; incision through both recti at the umbilicus combined with a short median longitudinal incision from the umbilicus downward. If now the transverse colon is pushed slightly upward and the small intestine to the left, the field of

operation is easily accessible. The pars horizontalis inferior and ascending duodenum are seen, also the radix mesenterii, and shining through these the superior mesenteric artery and vein, which cross the internal surface of the pars horizontalis inferior of the duodenum, while the vena cava inferior lies posteriorly to this part of the intestine. To expose the latter the peritoneum is incised at the lower margin of the pars horizontalis duodeni and the intestine pushed upward a little, similar to the procedure in retroduodenal choledochotomy. When the loose retroperitoneal tissue is severed by blunt dissection, the inferior vena cava lies free to a great extent and can easily be separated from the surrounding tissues. Now the mesenteric vein is freed and the overlying arteria colica dextra is protected. It is easy to avoid injuring the branches of the superior mesenteric vein.

In the majority of cases the main branch of the superior mesenteric vein can be brought into contact with the vena cava without kinking for a length of from 4 to 5 cm. The typical side-to-side anastomosis between the two vessels is made. The small side branches of the vena cava are first ligated; the side branches of the mesenteric vein being tied with a thin rubber band during the operation. Two rubber bands are placed under both vessels; by pulling on them the vessels are brought together so as to touch, are elevated, and at the same time the blood stream is interrupted. A strip about 3 cm. long and 2 cm. broad is cut from the touching surfaces of the vessels. Then the vessels are irrigated with salt solution, vaseline applied, and the margins of the vessels sutured.

The technique described is easily carried out in the majority of cases (16 out of 20 trials). Occasionally complications arise. The distance between the two veins may be abnormally great so that there might be danger of kinking of the mesenteric vein, or so that it might be necessary to use a smaller branch, which would involve the danger of thrombosis; or the duodenum may hang down between the two vessels so that there would be danger of pressure on it after the anastomosis. In case of the latter complication it would probably be simplest to add to the anastomosis of the veins a gastro-enterostomy with the Murphy button, which would prolong the operation only a few minutes. The first form of complication was found three times in 20 cadavers. In these cases instead of a side-to-side anastomosis between the mesenteric vein and the vena cava a piece of the internal jugular of the same individual is used, the central end being implanted into the vena cava, the peripheral into the superior mesenteric, end-to-side.

The last-mentioned modification does not give any technical difficulties but prolongs the operation considerably; but it can be performed within an hour and could be done *in vivo* under local anesthesia, making it possible to perform it on patients with low vitality, which makes it of especial value in cases weakened by long illness.

A. GORE

Elsie, J. E.: Malignant Tumors of the Gall-Bladder. *Northwest Med.*, 1916, 11, 47.

The author discusses malignant tumors of the gall-bladder with reference to their incidence, type, method of growth, and microscopic picture. Carcinoma occurs much more frequently in the gall-bladder than sarcoma. Of those having carcinoma, one in six is found to be primary in the gall-bladder. The point of origin is most frequently in the fundus, the next in frequency being in the neck. Tumors originate either from the epithelial lining of the gall-bladder or from that of the mucous glands. Three types retain the cylindrical form of the cells: adenocarcinoma, papillary carcinoma, and the solid cylindrical cell type of carcinoma. The adenocarcinoma arising from the mucous glands or from the adenomata of the gall-bladder is the most common form. The adenocarcinoma may also arise from the glands of Luschka, which normally penetrate some of the muscular coats following the course of the blood-vessels.

Metastasis from gall-bladder carcinoma does not occur as early or as rapidly as from carcinoma of the gastrointestinal tract, because the gall-bladder is poorly supplied with lymphatics. Metastasis arising from carcinoma at the fundus does not occur as early as that arising at the neck. Liver involvement is usually by direct extension because there is no direct lymphatic connection. The growth may attack by continuity the hollow viscera ulcerating through the portal vein. Involvement of the vein causes thrombosis with consequent ascites. Cancer of the gall-bladder is a disease of old age, and 75 per cent of the cases occur in women because of the greater proportion of women than men having gall-stones. Gall-stones are present in the majority of cases, the percentage varying from 66, as found by Tiedeman, to 100 per cent in the records of Marchand.

HARRY G. SLOAN.

Zimmerman, B. F.: Cholecystitis. *Am. J. Surg.*, 1916, 111, 11.

The most prominent factors in cholecystitis are infection and obstruction to biliary outflow, but without obstruction infection cannot take place in a healthy gall-bladder. The chief source of infection is the alimentary tract and the lesions most commonly giving rise to cholecystitis are typhoid and appendicitis. Secondarily, ulcers and acute catarrhal processes of the intestinal tract are starting points of the infection.

The obstruction to the biliary outflow is due to a variety of causes, chief of which are swelling of duodenal mucous membrane, pancreatitis, malignancy, and adhesions.

As cholecystitis and cholelithiasis are so intimately connected the author makes no attempt to differentiate them.

The chief symptoms of cholecystitis are usually referred to the digestive tract, there being noted, pain, eructations of gas, nausea, and vomiting which occur during or soon after eating certain foods,

thus causing the patients to select a special diet. These symptoms may be explained by the alteration in the bile, and the intimate relation between the stomach and gall-bladder through the sympathetic nervous system. The pancreatitis so often found, is probably due to a lymphadenoma brought on by the enlargement of the lymph glands which thus blocks the lymph channels between the gall-bladder and the pancreas.

In acute cholecystitis there is gastric hyperacidity while in the chronic form a lowered acidity is found.

The pain varies from mild epigastric discomfort to a severe gall-stone colic. In acute attacks it may be a severe aching form due to distention or a more intense boring sort due to peritoneal involvement. It is located in the epigastrium and right hypochondrium and radiates to the back, neck, or arm. In the milder types there is only moderate tenderness and rigidity; in the severe, however, it is most pronounced.

As a rule, fever is only present in the acute form. The typical septic type occurs when the bladder, neck, or ducts are involved, as the gall-bladder itself is not rich in lymphatics.

Jaundice is seldom present except when ducts are involved or a stone has become impacted.

Emphasis is laid on the taking of a careful history to aid in the differentiating. Between cholecystitis and intestinal ulcer the chief points are the periodicity of the latter with attacks of gas, sour eructations, and vomiting of increasing duration and severity. The pain is in the epigastrium and radiation is uncommon; it occurs 3 to 4 hours after meals and is relieved by food or alkalis. In cholecystitis pain is usually constant with acute exacerbations, radiation being common.

In chronic appendicitis there is usually hyperchlorhydria, a distinct history of appendiceal inflammation. In acute cases with a high appendix it may be, however, impossible to differentiate.

In functional gastric neuroses it is often exceedingly difficult to differentiate; a complete history and examination are most essential.

Clinically, the diagnosis of cholecystitis with or without stone is not always easy. Pain, vomiting, and jaundice may be absent. Usually, however, there is epigastric distress accompanied by more or less rigidity and tenderness over the gall-bladder. A careful complete history is essential. If doubt remains an exploratory celiotomy is in order.

In cases where stones are found without extensive alteration of the gall-bladder, relief is afforded by removal of the stones and drainage. Mayo claims 90 per cent cures in these cases.

Cholecystectomy is recommended whenever the gall-bladder is extensively diseased or altered, in cases with a "strawberry" gall-bladder, and in cases of cholecystitis uncomplicated by gall-stones. Mayo recommends cholecystectomy in all cases of cholecystitis and in 80 per cent of all gall-stone cases.

Cholecystectomy should never be performed in an acute attack of cholecystitis with or without stones; a subsidence of the acute symptoms should be awaited.

P. M. CHASE.

Troell, A.: Ligation of Splenic Vessels as a Substitute for Splenectomy in Blood Diseases. *Ann. Surg.*, Phila., 1916, LIII, 83.

The results from splenectomy in Banti's disease and in pernicious anemia have been so favorable that the operation of splenectomy is justifiable and the indications for its employment reasonably clear. However the operative mortality is so high (8 in 11 cases of pernicious anemia, 50 per cent in Banti's disease) that splenectomy is not to be lightly undertaken. It occurred to the author that ligation of splenic vessels might give as favorable results as splenectomy, where the latter was indicated, as ligation of thyroid arteries has favorably influenced the course of Graves' disease.

In the first series of his experiments twelve animals were operated upon. One to five splenic arteries and veins were ligated in each animal, at least one artery and vein being left free. Careful blood counts were made from the splenic artery and vein of each animal before and after ligation of the vessels. Confusing and contradictory results were obtained in regard to the changes in the spleen. Eight dogs, one cat, and three guinea pigs were operated upon in this series. The spleens of six dogs were unchanged by the ligation; one dog showed multiple infarction of the periphery of the spleen, another a small hemorrhagic infarct in the upper part. One cat showed multiple infarction of the organ, while in the guinea pigs all the spleens showed a marked decrease in size relative to the number of vessels tied, and none showed infarction. These results led to a careful anatomical study of

the blood-vessels of the spleen in the dog and man, and the author demonstrated the presence of free lateral anastomosing branches, not only between the splenic and the gastro-epiploica sinistra, but also within the hilum of the spleen. This led him to conduct a second series of experiments in which these lateral anastomosing vessels were cut off by passing a ligature at right angles from the first constricting band well into the concavity of the spleen hilum. Ten dogs were operated upon in this series and all showed the expected result; i.e., either infarction or noticeable reduction in the size of the spleen. The spleens were removed and examined from ten minutes to six weeks after ligation and the various pathological findings were carefully described. From the pathological study the author concludes that shrinkage in dogs' spleens follows the production of infarcts, but suggests the possibility of reducing the size and function of the spleen without the production of infarcts by more careful selection of vessels to be tied.

The study of spleen function by blood counts direct from the splenic artery and vein and the peripheral circulation were abandoned because the difference in the number of cells in cubic millimeters was too slight to form a basis for conclusions.

The author's experiments proved the harmlessness of splenic infarcts as foci of infection (staphylococci were injected into the circulating blood without resulting infection of infarcts); they proved that the gross volume of spleen tissue could be materially reduced by ligation of vessels. Therefore the author concludes, while admitting that the results of animal experimentation may differ from operations on man, that the ligation of splenic vessels deserves a clinical trial as a substitute for splenectomy, especially where adhesions from peritonitis make splenectomy impossible.

E. FISCHEL.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS. CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

D'Agata, G.: *Osteous Sporotrichosis* (*Sporotrichosis ossis*). *Policlin.*, Roma, 1916, XXIII, 1.

From personal researches and experimentations, the author draws the following conclusions:

1. Although bony and periosteal changes are due mainly to tuberculosis, to syphilis and other granulomatous processes, we may enlist in the pathology of osteomyelitis and osteoperiostitis, subacute or chronic sporotrichosis as a causative factor.

2. When such conditions do not present themselves associated with characteristic cutaneous lesions the diagnosis of the condition is extremely difficult on account of the absence of definite differential points between manifestations similar in appearance but of a different nature.

3. Such difficulty is fortunately largely overcome by the simplicity of the laboratory means of demonstration (culture examination, biological proof, etc.).

4. With the sporotrichium *Beurmanni*, isolated from a case of osteoperiostitis of the superior maxillary (simulating a tubercular or syphilitic process), it has been possible to obtain and demonstrate in the bones of animals used for experimentation a sporotrichotic osteoperiostitis and osteomyelitis.

RAOUL L. VIDIAN.

Taylor, H. L., and Frieder, W.: *Outlet Hip Disnee*. *Surf. Gynec. & Obs.*, 1916, LIII, 138.

The author's paper was based on a study of 19 cases. The affection usually comes on insidiously between the ages of four and sixteen. A few cases have an acute invasion, sometimes polyarticular, and a few occur after trauma. In the series observed by the authors it occurred about twice as

often in boys as in girls, and there were about twice as many right-sided as left-sided cases; one case was bilateral, and one or two others showed some radiographic abnormality on the side without symptoms. Slight lameness which is often painless is the most striking symptom. Pain when it occurs is not severe and may be referred to the hip, knee, or groin. The general health is not impaired, and activity is only moderately curtailed. After some months there may be a shortening of from one-fourth to one-half inch. Motion is but little interfered with at first, but later rotation and lateral motion are limited and the plane of flexion is deflected outward, but two-thirds or more of the range is usually preserved. The X-ray picture is characteristic: the head is flattened; the epiphysis is thin and irregular and pressed out towards the trochanter; there may be clear spaces on either side of the epiphyseal line.

The patients get well under very simple treatment or none at all with a good, though not a perfect, joint. Abscess, fixed deformity, extensive shortening, and ankylosis do not occur.

This affection is neither tuberculous nor syphilitic. It has been but little noticed in the literature of this country, but is known in Europe as osteochondritis of the hip or Perthes' disease.

Stromeyer, K.: Traumatic Edema of the Hand (*Hand. Traumatiches Ödem des Handgelenks*). *München, med. Wochenschr.*, 1915, No. 10.

The author reports a case of traumatic edema of the dorsum of the hand occurring after the operative removal of a needle. In his case, the mobility of the hand became gradually less and was almost entirely lost three months after the operation. The scar left from the operation was then thoroughly excised and the mobility of the hand recurred within five weeks when it reached an almost normal condition. The author concludes that the foreign body carried with it an inflammatory agent of such low virulence as to cause a chronic inflammation of the lymphatic channels. Pathologically, the condition is, therefore, that of a toxic elephantiasis.

A. STREINLER.

Worms, G., and Hamant, A.: Study of Coxa Valga (*Étude sur la coxa valga*). *Rev. de chir.*, 1915, 21:14, 211.

The authors made a complete review of the whole subject of coxa valga. They distinguish the following types: (1) congenital coxa valga, (2) isolated, (3) combined with congenital luxation, (4) luxating and subluxating varieties; (1) traumatic coxa valga; (2) coxa valga of rachitic origin or associated with other bone softening processes; (3) static and functional coxa valga; (4) the coxa valga of adolescence, called idiopathic.

The first part of the contribution consists of a historical review under each of the above headings, showing the evolution of our knowledge of the condition and a number of important cases from the

literature are described in brief to illustrate the chief clinical points. These include some cases of their own.

In the second part they consider the symptomatology, diagnosis, and treatment. They define coxa valga as any deformity of the superior extremity of the femur characterized by an alteration in the position of the neck, complicated or not by anteversion and torsion about its great axis. The degree of the deformity is generally measured by the value of the angle of inclination of the femoral neck. Two to three per cent of cases of congenital luxation are accompanied by a certain degree of coxa valga.

The greatest number of cases of coxa valga are to be found in the static-functional group. They are consecutive to changes of orientation of the vertebral skeleton or of the lower limbs. Good conformation of the femoral angle depends on the harmonious play of three forces, the weight of the body, the resistance of the bones, and the muscular contraction. Deficiency or absence of any of these alters the position of the femoral neck. Coxa valga is above all a deformation by bony discharge in contradistinction to coxa vara, which is the consequence of an exaggerated surcharge.

Symptomatology does not offer any very pathognomonic signs. Its origin ordinarily slow and insidious, sometimes masks itself as an articular reaction characterized by fatigue on walking, pain in the hip, and claudication. Clinically it must be differentiated from coxalgia with abduction, from sacrocoxalgia, and from congenital luxation without coxa valga.

In general, cases of coxa valga allow sufficient use of the limb. The tendency is towards normal conformation and there is rarely a resulting infirmity. In treatment, surgical intervention is rarely called for as the ordinary orthopedic treatments suffice, but where surgery is called on, the methods in use are: (1) cuneiform osteotomy of the femoral neck; (2) linear osteotomy at the base of the neck; (3) subtrochanteric cuneiform osteotomy, resection of a corner at the internal base in the subtrochanteric region.

The article is accompanied by an extensive bibliography. A. Goss.

FRACTURES AND DISLOCATIONS

Chutro, P.: Treatment of Fractures of the Lower Limb with Continuous Extension by Means of Finocchio's Stirrup Apparatus (*Traitement des fractures du membre inférieur par l'extension continue au moyen de l'étrier de Finocchio*). *Presse méd.*, 1915, p. 101.

Chutro calls attention to the traction apparatus described by Finocchio in *La Prensa Médica Argentina*, which is known in Argentina as "Finocchio's stirrup."

Chutro has tried this apparatus, which he describes and illustrates, in his hospital service at Buenos Aires with good results in thigh and leg

fractures. He has applied it also in military service in a severe thigh fracture which had already been treated with other apparatus. In this case the results were likewise excellent. He thinks that in severe war fractures no apparatus is more valuable for continuous extension.

W. A. BRENNAN.

Tanton, L.: A Case of Traumatic Separation of the Superior Epiphysis of the Tibia (*Un cas de décollement traumatique de l'épiphyse supérieure du tibia*). *Bull Soc. de chir. de Par.*, 1916, xlii, 27.

This is a very rare injury. Of 37 epiphyseal separations Guérétin found only one of the upper epiphysis of the tibia. Bruns found 4 per cent. Poland collected 13 confirmed by anatomical examination.

Tanton reports a case in a boy of 12, the result of an automobile accident in which a wheel passed over the upper part of the left leg. The treatment was by reduction and flexion, the limb being immobilized while flexed, after the methods of Hutchinson and Bernard.

A. GOSS.

Lange, F.: War Orthopedics (*Kriegsorthopaedie*). *Zeitschr. f. orthop. Chir.*, 1915, xxv, 3.

In summing up his experiences, the author makes the following recommendations:

1. Physicians in the field should receive orthopedic training.
2. Field ambulances and movable hospitals should be provided with proper equipment for the application of good plaster-of-Paris bandages.
3. The ideal treatment would consist of immediate application of a plaster-of-Paris bandage for purposes of transportation in all cases of gunshot fracture.
4. Since this cannot be accomplished, however, use should be made of proper splints, which should be at hand in sufficient quantity.
5. With or without plaster bandage, any gunshot fracture should be transported to the home hospital with the least possible delay.
6. For transportation by auto trucks, the author recommends a special hammock as provided by the German army regulations for use in tents.
7. On trains, it is preferable to place the patients on stretchers.
8. Upon arriving in the home territory, the patient should be directed to special hospitals and for this reason the establishment of consulting orthopedic physicians in the home territory is recommended.
9. Well adapted fractures are treated with plaster-of-Paris splints, otherwise fragments are to be replaced until well adapted.
10. The windows cut in the case must be well covered with cotton to prevent soiling by pus.
11. In deep suppurations the open treatment of the wound is recommended.
12. As soon as possible mobilization of the joint should be instituted. Resistance and pendulum apparatus are recommended.

A. STEINDLER.

SURGERY OF THE BONES, JOINTS, ETC.

Burckhart, H., and Landolt, F.: The Treatment of Infected Joints in the Field (*Erfahrungen ueber die Behandlung infizierter Gelenke im Kriege*). *Muenchen med. Wochenschr.*, 1911, No. 21.

The following are the authors' conclusions resulting from their experiences in the field: The resections of the wrist, ankle, and elbow joints give very good results. Resection of the knee-joint is indicated where there is only moderate bone destruction, where the working conditions are favorable and the general condition of the patient is satisfactory. Wherever these requirements cannot be met, amputation is by far the safer procedure.

In suppurations of the shoulder and hip joints the prognosis is dubious from the beginning. The authors recommend as the first step simple drainage and fixation. Later, if the patient has recovered from the shock, the resection may be performed. The greatest importance is placed upon the exact fixation of the joint with a subsequent minimizing of the resorption of toxic products from the wound. If the cases are properly selected and especially if the anatomical details receive due consideration in the establishment of drainage, the conservative treatment of infected wounds of the joints is very satisfactory.

A. STEINDLER.

Gerulanos, M.: Muscle Transplantations in the Shoulder Girdle (*Ueber Muskeltransplantationen im Schulterguelte*). *Arch. Klin. Chir.*, 1918, lxxv, Aug.

The author reports on two cases in which the paralyzed serratus muscle was supplanted by the pectoralis major. The sternal portion of the pectoralis muscle was laid bare, its insertion at the humerus was dissected off together with the periosteum and a small flap of bone, and was fastened with silver wire to the lower end of the scapula. In the second case, a paralysis of the trapezius, rhomboid, and latissimus dorsi muscles existed in addition to the paralysis of the serratus muscle. The resection of a thin flap of bone in connection with the periosteum and the tendon of the pectoralis muscle is, in the opinion of the author, important because it makes possible the securing of a firmer attachment of the transplanted tendon to the lower angle of the scapula.

A. STEINDLER.

Mayer, L.: The Physiological Method of Tendon-Transplantation. *Surg., Gynec. & Obst.*, 1911, xxi, 182.

The author outlines the inception of his research and the basic facts of tendon anatomy and physiology. The research was the logical outgrowth of an extensive series of animal experiments conducted during 1911 in the clinic of Professor Lange, Munich, in which Henze and Mayer investigated the methods of preventing post-operative adhesions to tendons. The experiments proved the validity of Biesalski's technique by which the normal re-

lationship between tendon and sheath was maintained by drawing the transplanted tendon through the sheath of the paralyzed tendon. Biesalski's method, however, made no provision for the prevention of adhesions in the course of the tendon from its original site to the new sheath. The natural sequence of these experimental data was the perfection of Biesalski's technique so as to render it physiological in all its phases.

To do this the hitherto vague or unknown finer anatomy and physiology of tendons had to be investigated by animal dissection controlled by microscopical preparations, by animal experiments, and by observations at the operating table. The plan of study resolved itself into four main divisions:

1. The general conceptions of tendon anatomy and physiology, with the following subheadings: (1) The relation of the tendon to its sheath, the fascia, and the surrounding loose connective tissues. (2) The blood supply of tendons. (3) The mechanism of the gliding of tendons. (4) The tension of tendons.

2. The anatomy and physiology of each individual tendon.

3. The application of these facts to the technique of tendon-transplantations.

4. The experimental and clinical results.

Biesalski: Protheses in Amputations of the Arm (*Prothesen bei Amputationen des Armes*). *München. med. Wchnschr.*, 1915, No. 44.

The author emphasizes the necessity of co-operation on the part of the patient. Contrary to the opinion of others, the author believes that the daily duties may be carried out very well by one artificial hand with a tool attachment; for cosmetic reasons, this working hand may be supplanted occasionally by an immovable rubber hand. He has a man working in his shop who is able to carry on with one hand almost all of the work that a normal worker would be capable of, and for this reason he thinks that the unarmored, if fitted with the proper protheses and properly trained, may almost attain the same level of earning power as the normal individual, which will result in keeping many maimed men from becoming public charges.

The thorough and systematic way in which the manufacture of artificial hands is now being carried on in Germany is of great interest. In Vienna, Professor Exner has charge of an institution for the experimental study of the manufacture of artificial hands, the main object being to arrive at a standard model which will give the best efficiency and which can be made in such quantities as to make the individual expense extremely low. Furthermore, there is a veritable industrial branch developing in Germany, not only in regard to the manufacture of arm protheses, but also in regard to the employment of one-armed individuals. This will prove of incalculable benefit to the many thousands who have suffered the loss of an arm during the war.

A. STEINLER.

Depage, A.: Note on Thigh Amputations (*Note sur les amputations de la cuisse*). *Bull. et mém. Soc. de chir. de Par.*, 1915, cin. 508.

The published statistics of thigh amputations during the course of the war have not been brilliant. They show a mortality of 82 per cent. Depage, during the first six months of 1915, made 26 amputations with a mortality of 65 per cent. From July 1, 1915, to Jan. 1, 1916, however, in 26 other amputations his mortality was reduced to 30 per cent. This amelioration he ascribes to (1) better established operative indications; (2) a more suitable operative technique; (3) a more appropriate anesthetic; (4) a more efficacious secondary treatment.

While in the earlier period ether and chloroform were used as anesthetics, since July spinal anesthesia with novocaine has been used. While intravenous injection of isotonic chlorinated solution constitutes the surest means of reanimating exsanguinated and badly shocked subjects, yet he has found the massive injection of one to two liters of physiologic serum into the femoral vein near the section of the stump much better in its results.

A. Goss.

Witzel, O.: Hand and Arm Protheses of the Maimed in the War (*Aufgabe und Wege fast den Hand- und Armersatz der Kriegswunden*). *München. med. Wchnschr.*, 1915, No. 44.

In the opinion of the author the expensive and complicated artificial arms and hands are not a whit more useful or practical than the simple and inexpensive protheses with which the war cripples are now generally supplied. The flexion of the hand and opposition of the thumb are now being manipulated by the other hand, but the limits of these artificial hands are rather narrow as far as function is concerned. Much better results are obtained by the use of the so-called working hand to which a simple tool or hook is attached. For cosmetic purposes, a simple removable "Sunday-hand" is furnished to the man and, according to the author's experience, this arrangement meets with general satisfaction.

A. STEINLER.

ORTHOPEDICS IN GENERAL

Judson, A. B.: Trigger Finger (*Der schnellende Finger*). *Ztschr. f. orthop. Chir.*, 1915, XXX, March.

A case is reported in which trigger finger occurred in a patient seventy-six years old who was afflicted with chronic arthritis of the fingers. After a long fixation with an aluminum splint, the jerking motion became less violent when flexion was attempted, but the accompanying pain still persisted.

A. STEINLER.

Neiber, O.: Osteochondritis Deformans Colae Juvenilis. *Ztschr. f. orthop. Chir.*, 1915, XXX, March.

The author reports 4 cases which came under his observation which correspond to the picture de-

scribed by Perthes. The most significant findings in the X-ray picture were a defect in the bony substance, the lessened height and flattened contour of the head of the femur. The treatment consisted simply in a plaster-of-Paris spica, later, massage and gymnastic exercises. The results were good in all cases. The pain in the hip disappeared quickly after the application of the cast. A. STEINDLER.

Brandes, M.: Late Deformities in Reduced Congenital Hips and Osteochondritis Deformans Juvenilis (Spätkrümmungen bei reponierten Hüften und Osteochondritis deformans juvenilis). *Ztschr. f. orthop. Chir.*, 1915, XXXV, March.

In establishing the clinical picture of osteochondritis, Perthes has made a distinction between this condition and those changes which are often noted as following the reduction of dislocated hips. In Perthes' disease there is present a chronic inflammatory process leading to deformity and presenting a well-defined clinical aspect. The typical X-ray findings are those of the splitting up of the head of the femur into several fragments. The histological examination which was carried out by Perthes in one case also shows that this condition has nothing to do with arthritis deformans. It has been especially noted that there is no disturbance of the smooth joint surfaces in Perthes' disease, although there may be a flattening of the head or a slight displacement of the formation of the coxa vara. In osteo-arthritis coxae juvenilis there is probably an acute or chronic trauma or unfavorable static conditions, as has been described by Preiser. The main difference between these two conditions is the lack of changes of the joint surfaces in Perthes' disease; whereas these changes are characteristic of osteo-arthritis. A. STEINDLER.

Engelmann, G.: Congenital Defect of the Femur (Ein seltener Fall von congenitalem Femur defect). *Ztschr. f. orthop. Chir.*, 1915, XXXV, March.

The case is reported of a man twenty-seven years old who showed considerable shortening of the right limb. The X-ray revealed that at the level of the lesser trochanter the femur was kinked off in a sharp angle in such a way that the upper part of the femoral head articulated with the lower part of the socket. This picture is most suggestive of an intra-uterine fracture. Reiner, who has studied this condition, considers the deformity to be the result of a chronic intra-uterine trauma, probably a pressure of the uterine wall. A. STEINDLER.

Saxl, A.: Static Pains in the Knee (Statische Knie-schmerzen). *Ztschr. f. orthop. Chir.*, 1915, XXXV, March.

The author discusses the question of referred pain in the knee resulting from flat-foot or affections in the hip-joint. Local knee-pain from static causes is often seen in genu varum and valgum, also in cases of genu recurvatum. In this study the author pays special attention to the sensations of

pain occurring in the flexor tendons of the knee. As a rule, these pains occur only in standing or walking or on overexertions and are elicited by the tendency of overextension on the part of the joint. In some cases, there is also noted a tension in the gastrocnemius muscle with shortening of the tendo achillis. A characteristic point is static knee-pain is the strict localization of the pain around the condyles of the femur and tibia. The treatment consists in elevation of the knee, gymnastic exercises, and if necessary, operative lengthening of the tendo achillis. A. STEINDLER.

Werndorff, R.: Method of Hammering in Club- and Flat-Foot (Verhämmerung des Klump- und Platt-Fusses). *Ztschr. f. orthop. Chir.*, 1915, XXXV, Feb.

The author's method consists in adding to the bloodless correction of the club- or flat-foot a practice of hammering these deformities into correct shape. A metal plate, one centimeter in thickness, is placed on the sole of the foot and with a number of well-directed strokes with the hammer, the foot is modeled into shape. A. STEINDLER.

Gansen, M.: Dorsal Edema of the Foot (Die Fuss-Geschwulst und ihre Ursachen). *Ztschr. f. orthop. Chir.*, 1915, XXXV, Feb.

This affection occurs frequently among the soldiers of the continental armies and also among civilians after enforced and strenuous marching. In the German army alone, 12,000 to 16,000 men, or 2.5 per cent are being treated annually for this trouble. All authors agree that the strain of enforced marching is the eliciting cause of the trouble, but there is great discrepancy in regard to the underlying pathological conditions.

In his very exhaustive treatise the author emphasizes the fact that the majority of cases of edema of the foot do not show a fracture of the metatarses, though the radiograms show thickenings of the metatarsal shafts, mostly of the second and third metatarsals. There is a noticeable spasm of the interossei which can be best demonstrated clinically by the fact that pressure upon the interosseal spaces renders the passive abduction and adduction of the toes difficult and painful. This condition of the interossei muscles is entirely analogous to the spasm of the calf muscles in flat-foot. In addition to this, spasm of the extensors and peronei, as in true flat-foot, is observed. The periosteal thickening is confined to the places of origin of the interossei and is regarded by the author as traumatic periostitis. The edema is likewise explained by the spastic condition of these muscles. In regard to prophylaxis walking upon the toes with a good insole and a proper shoe which avoids side pressure of the forefoot will do much to prevent this disease.

The treatment consists mainly of rest and fixation until the edema has disappeared; later, massage and hot packings and warm foot-baths are used to overcome the spastic condition and to restore the

free lateral mobility of the toes. When dismissed the patient should be supplied with a good insole to prevent a recurrence of the disease. A. STRINDLER.

Orr, H. W.: The Character of Orthopedic Treatment Necessary and Its Importance During the Period of Spontaneous Improvement After Infantile Paralysis. *Lancet Clin.*, 1916, CIV, 182.

Much of the disability and most of the deformity now following infantile paralysis is avoidable. Adequate care for the first year following the acute attack would save a large proportion of the present sequelae.

The paralysis is due to partial or complete destruction of motor cells and peripheral nerves; it is usually

temporary because the motor cells for any muscle lie at different cord levels, and are rarely all involved, and because many involved do recover. Permanent paralysis is due to the fact that such muscles have been overstretched by contraction of unparalyzed opponents, or by weight-bearing without protection.

Mechanical protection against overstretching and deformity is the prime factor. It alone should be used during the painful stage, and should not be accompanied by any massage, exercises, or electricity. No treatment following this acute attack is adequate unless accompanied by protective splints or apparatus. The simple methods are the best, and for a great majority of cases, plaster of Paris is fully sufficient. R. G. PACKARD.

SURGERY OF THE SPINAL COLUMN AND CORD

Janssen, T. H.: Early Diagnosis of Tuberculosis of the Spine (*Frühdiaagnose der Wirbeltuberkulose*). *Hannover med. Wochenschr.*, 1915, No. 35.

In this very interesting study, the author points out several symptoms of early diagnosis in spinal caries. In a number of cases the observation was made that the pressure tenderness existing along the inner border of the os ilei could be followed out along the entire course of the ileo-inguinal nerve. Very often after long standing or walking, circular pain may appear similar to the girdle pain. Pain in the lower abdominal region is observed, especially in low-seated tuberculosis of the spinal bodies. In a number of cases the examination showed spastic contraction of the long muscles of the back. The author favors the method of Rollier and the insolation with the quartz lamp. The fixation is carried out by a mattress. A. STRINDLER.

Galli, G.: Spondylitis Typhosa (Spondylitis Typhosa). *Hannover Med. Wochenschr.*, 1915, No. 15.

Scarcely more than a hundred cases of spondylitis typhosa have been described in the literature. The author found one case among 1,800 cases of typhoid, a man 59 years old. The complication in the spine usually occurs during the period of convalescence, sometimes even later. Rogers reports one case occurring six months after the typhoid attack. Very characteristic are the violent pains in the back which cannot be alleviated by anodynes. The pain is by far more pronounced than in tuberculosis. Rarely a gibbus is formed but sometimes a scoliosis is noticed due to the contraction of the musculature. No suppuration occurs and the prognosis in general is favorable. The treatment consists in the application of a plaster-of-Paris corset. A. STRINDLER.

Delbet, P.: Traumatic Spondylitis (Spondylite traumatique). *Rev. gen. de clin. et de lab.*, 1916, III, 212.

Traumatic spondylitis occurs under varying conditions. In some cases there may be no primitive

symptoms as regards the vertebral column at the time of the accident. Deformation and sometimes radicular or very accentuated medullary effects may only show themselves as late secondary effects. In radiographs, however, of such patients very frequently grave lesions are found. There may be a fracture of the vertebrae; if so it usually is an addition fracture rather than an ordinary oblique fracture which is always accompanied by immediate gibbosity.

In an injury to the vertebral column, even if there be no notable symptoms, it is necessary to watch the patient with the greatest care. If after a few days the condition is not satisfactory, immobilization must be resorted to. There are cases of spondylitis in which the radiograph does not show any clear lesion. Defective early treatment may result in radicular compression and medullary disturbances being established later on.

W. A. BRUNNAN.

Hartwell, J. B.: Fractures of the Spine Without Paraplegia. *Am. J. Orth. Surg.*, 1916, XIV, 81.

During six months' service in the male surgical division of the out-patient department of the Massachusetts General Hospital, 10 patients who sought relief for pain in the back were found to have a fracture of the spine, and one patient with spinal fracture was treated in the orthopedic division. Not one of the cases had at any time had any motor or sensory paralysis or sphincteric disturbance. Of the series 8 cases were compression fractures, one was a fracture dislocation, and 2 were fractures of the transverse processes of the lumbar vertebrae.

Pain in the back is the chief subjective symptom; it is well localized and constant. In none of his cases did it radiate nor were there any other signs of nerve-root pressure. Localized tenderness over the spinous process should always suggest the possibility of fracture of the spine and if in addition there is misalignment of the spinous processes, the diagnosis is almost certain. The final proof of the presence

of fracture must be determined by X-ray, but not only are satisfactory plates difficult to obtain but their interpretation is very difficult. Lateral views show unmistakable deformity of the vertebral bodies that check the diagnosis, and should be taken in every suspected case.

The kyphos caused by compression fractures may readily be mistaken for the deformity of a bad posture.

The treatment consists in prolonged fixation of the spine in extension, by plaster jackets. If the pain is not relieved or if there is an increase in the knuckle, permanent splinting of the spine by an Albee operation or one of its modifications is indicated.

PHILIP LEWIN.

Netter, A.: Serotherapy of Poliomyelitis (Sérothérapie de la poliomyélite). *Arch. de méd. d. enf.*, 1916, Jan.

The author gives a report on the intraspinal serum treatment of 32 cases of infantile paralysis. Complete cures were obtained in 6 instances; almost complete cures in 3 more; very marked improvement in 7 cases, and appreciable improvement in 5 more; 3 cases were not influenced at all, and 8 cases died, mostly on account of extension of the disease into the bulbar part of the cord.

The author believes that the rapidity of the improvement after injection, and, on the other hand, the arrest of the improvement when the injections were discontinued, leaves no doubt as to the efficacy of the method. If applied in the preparalytic stage it can prevent the appearance of paralysis. Only one case of this kind is reported by the author, but he believes that under certain conditions the treatment could be begun early enough to inhibit the paralysis. The serum of patients who have recovered from infantile paralysis maintains its effectiveness for more than thirty years. The injections must be made into the spinal canal, and must be renewed as a rule within eight hours. The dose varies from five to thirteen centimeters. Human serum is better tolerated in the spinal canal than horse serum. The latter may produce fever and pain, or other anaphylactic symptoms.

A. STEINDLER.

Engelmann, G.: Etiology of Habitual Scoliosis (Ätiologie der habituellen Skoliose). *Ztschr. f. orthop. Chir.*, 1915, XXX, March.

The author considers previous rickets of great importance in the etiology of subsequent habitual scoliosis and he distinguishes two types of rickets which may lead to deformation of the spine. First, the usual rachitic spine in which there is merely a retardation of ossification and, second, the diffuse malacic spine in which ossification sets in especially late and the vertebral bodies appear wedge-shaped. The latter condition is seen in the severe rachitic scoliosis of small children.

Habitual scoliosis originates in the opinion of the author in the disturbances found in the rachitic

spine of early infancy. The junction between the neural arches and the bodies are the seat of beginning deformities of the individual vertebra. If these are not overcome by subsequent growth habitual scoliosis will appear at a later period of life. Contributory causes for habitual scoliosis are the rigid requirements upon the spine during the years of rapid growth and schoolwork, that is, between six and fifteen. It is noted by the author that in order to produce habitual scoliosis later, the rickets need not necessarily be of the extreme type but may be of moderate type without any other rachitic stigmata being noticeable in the skeleton.

A. STEINDLER.

Nussbaum, A.: The Dangers of the Albee Operation in Pott's Disease in Children (Ueber Gefahren der Albee'schen Operation bei Pott'schen Buckel der Kinder). *Beitr. z. klin. Chir.*, 1916, XLIX, 123.

The author comments on the success of the Albee operation but warns against possible disadvantages developing later for the following reasons: The implanted bone-graft bridges over the epiphyseal lines of all ankylosed vertebrae. Inasmuch as the graft itself has no active power of growth it is to be expected that it will hinder the elongation of the spinal column. Furthermore, the increase in length of the bodies of the vertebrae finds a resistance in the transplanted bone and if the energy of growth of the epiphyseal lines is greater than the firmness of the transplanted bone, the latter must either be torn transversely or bent so as to form a lordosis.

In order to investigate these points the author experimented with three young dogs, leaving two other animals of like age as controls. Seven months after operation a pronounced lordosis had developed and the animals were decidedly smaller in size than the others, the latter point the author considers remarkable inasmuch as it shows that the hindering of growth of five vertebrae hindered the growth of the entire body.

The author concedes, however, that notwithstanding these disadvantages, the pronounced success of the operation in all other respects outweighs the drawbacks.

W. A. BRENNAN.

Roberts, P. W.: Fracture of the Vertebrae Without Cord Symptoms. *Surg., Gynec. & Obs.*, 1916, XLII, 195.

Illustrating his point by X-rays and photographs of four cases seen within a year, Roberts calls attention to the frequency with which fractures of the vertebrae without cord symptoms are overlooked. Three of the patients had passed ten days or more in hospitals and were discharged without discovery of the vertebral fractures, all of which were severe with crushing of the bodies and displacement of fragments.

The author believes that surgical textbooks, which seldom refer to the possibility of fracture of the vertebrae without cord symptoms, may be responsible for the failures in diagnosis, as most

authors emphasize the point that "paralysis is the most important and constant symptom in fracture of the vertebrae," and this has unfortunately become the accepted view.

Roberts suggests that all cases of spine injury should be examined for localized tender points over

the spinous processes and for deformity, which is usually of the rounded type, and that X-rays in two planes should be taken with apparatus of high penetration. In the series of cases reported cures were effected by the use of spinal braces, but where conservative measures fail bone grafting is indicated.

SURGERY OF THE NERVOUS SYSTEM

Morestin, H.: Palliative Treatment of Facial Paralysis by Plaiting of the Soft Subcutaneous Parts (*Traitement palliatif de la paralysie faciale par le frèquement des parties molles sous-cutanées*). *Bull. Soc. de chir. de Par.*, 1916, xlii, 156.

Morestin points out that while the ideal method is to establish the continuity of the interrupted nerve by suture and thus obtain integral return of function, yet in certain cases this ideal cannot be pursued. The idea of restoring function by anastomosis with another nerve though attractive is not easily put into execution. He has obtained successful results with muscular anastomosis. In one patient he united a strip of the temporal to a part of the orbicular as well as fixing the buccinator and masseter.

The reduction of the soft subcutaneous parts of the face by buried sutures, the plaiting and fixation of these to resisting planes, constitutes in itself a method, palliative it is true, yet powerfully efficacious and to be recommended on account of its simplicity.

He reports details of three wounded men who were treated by this method with excellent results.

A. Goss.

Morat, I. P.: A Case of Complete Section of the Spinal Cord Followed by a Partial Restoration of Sensation and Movement in the Regions Previously Paralyzed (*Un cas de section complète de la moelle épinière suivie d'une restauration partielle de la sensibilité et des mouvements des régions d'abord paralysées*). *Lyon chir.*, 1916, vii, 261.

Morat's contribution is very interesting. It relates to a soldier who received a gunshot wound in the region of the tenth rib about 12 cm. from the median line. Motor and sensory paralysis of the region below the level of the umbilicus followed with urinary and fecal retention, etc.

Although wounded April 26, 1915, the man was not operated upon until the following August. The spinal canal was opened in the neighborhood of the wound, and a piece of shell was extracted. The fragment had produced a complete section of the spinal cord between the tenth and eleventh dorsal vertebrae. The separated segments, which were about 15 mm. apart, were drawn together by sutures without, however, attaining contact. The wound closed by first intention. On the eighth day improvement was manifested by some movement of

the lower limbs. By the twelfth day voluntary flexion of the left leg was noticed. By the first of October there was restoration of muscular sensation. At the time of the report, 50 days after operation, there was still disturbance of sensation, and urinary and fecal incontinence persisted.

In this case Morat believes that the suturing of the cord had no effect in producing the improvements noted. He rather thinks it was due to a hypothesis founded on a property of the nervous system, viz., functional plasticity, that faculty of adaptation which permits, without creation or reconstitution of new elements, the interior connection of its elements under new conditions; and in case of mutilation the replacing of destroyed parts when they are necessary for the preservation of the individual. It is known from experiments on dogs that the greater part of the spinal cord may be removed and that certain necessary functions at first profoundly disturbed will become re-established in due course of time.

A. Goss.

Ingebrigtsen, R.: A Contribution to the Biology of Peripheral Nerves in Transplantation: Life of Peripheral Nerves of Mammals in Plasma. *J. Exp. Med.*, 1916, xliii, 251.

Ingebrigtsen notes the fact that it has already been demonstrated that in pieces of peripheral nerves removed from the living animal and kept *in vitro* under certain conditions, the first stages of Wallerian degeneration may occur exactly as in the peripheral part of a divided nerve in the living organism. The phenomena, he states, are identical, but the process takes place more quickly *in vitro*, and the conditions required for this degeneration *in vitro* are the presence of a solution of sodium chloride with some salt of bivalent metals—calcium, strontium, or magnesium—in suitable proportions, such as Ringer's solution.

The experiments were carried out in the following way: From a living rabbit pieces one-half to two-thirds cm. long were removed from the sciatic nerve, and the nerve-fibers were dissociated in Ringer's solution by means of needles. The fibers were put immediately into a drop of plasma on a cover-glass, which was inverted over a hollow slide, sealed with paraffin, and incubated at 37°C. The preparations were observed from day to day, under the microscope on a heated table and no changes in the fibers were noticed up to the tenth or twelfth day after incubation. In hardened and stained preparations

the nerve-fibers had the same appearance on the sixth, seventh, and eighth days as on the first day. In the nerve-fibers from the calcium plasma no degeneration occurred; whereas the nerves from the calcium serum and calcium Ringer solution tubes developed a degeneration in the usual way.

The author draws the following conclusions:

1. The Wallerian degeneration occurring in peripheral nerves by incubation in Ringer's solution and serum does not occur in plasma.

2. Peripheral nerves incubated in plasma give rise to no growth. The same is true of peripheral nerves in a Wallerian degeneration up to the fourth day.

3. Peripheral nerves in Wallerian degeneration from the fifth day give rise to a growth of the syncytium of Schwann. In cultures from later stages there is a progressive growth of the same structure. It is evident that the proliferation of the cells of Schwann is directly produced by the degeneration of the axis cylinder and its myelin sheath.

4. In no case was growth of axis cylinders observed.

5. The growth of the syncytium of Schwann from degenerating nerves affords a basis for an anatomical conception of the centrifugal orientation of growing axis cylinders in regeneration.

6. Morphologically there is a striking resemblance between the syncytium of Schwann and neuroglia growing in plasma.

GEORGE E. BEILBY.

Schiffbauer, H. E.: Operative Treatment of Gunshot Injuries to the Peripheral Nerves. *Surg., Gynec. & Obst.*, 1916, XXII, 133.

Schiffbauer, who has served in the German army since the beginning of the present war, gives the results of an extensive experience with gunshot injuries to the peripheral nerves.

As indication for operation he gives the presence of completely severed nerves, which condition can be recognized by the absence of motor, sensory, trophic, and vasomotor functions, to be determined by the usual tests. He states, however, that it is necessary to wait at least three months before a definite diagnosis is possible that the nerve has been completely severed, because in some cases there is an automatic restoration of function up to that time.

Schiffbauer favors the earliest possible time for operation after the positive diagnosis is possible and about six to eight weeks after the wound is completely healed, because the earlier the operation is performed, the better are the anatomical relations maintained. The scar tissue is present in small amount; it is soft and easily removed. The capillary oozing is diminished, thus preventing the tendency to hematoma formation and the development of more scar tissue. He also points out other bad results in case the operation is long postponed, such as compression of the nerves by callus or scar tissue, the increase of scar tissue because of the presence of foreign bodies, deformities of the joints and con-

traction of the healthy muscles, as well as the occurrence of many trophic changes.

A definite technique of operation is described of which the principle points are perfect coaptation, prevention of hematoma, and early passive motion. All operations are performed without the Esmarch constriction. All scar tissue is carefully removed. The nerve-ends are carefully mobilized and perfect coaptation is accomplished by suturing the perineurium with very fine silk. After this the nerve is placed in a new muscle-bed free from scar tissue. Special care is taken to guard against tension.

Lyle, H. H. M.: The Physiological Treatment of Bullet and Shell Wounds of the Peripheral Nerve-Trunks. *Surg., Gynec. & Obst.*, 1916, XXII, 177.

These remarks are based on the study of cases observed while in charge of Hospital B, American Ambulance, Juilly, Seine et Marne.

The literature of military surgery is rich in the operative treatment of gunshot wounds of the peripheral nerves, while the preliminary treatment has received scant attention.

There is no sure method of immediately differentiating between anatomical and physiological blocking of nerve impulses. The failure to recognize this has led to many unnecessary and harmful operations. As all projectile wounds are potentially infected, operative measures are contra-indicated. For these reasons it was the practice at the ambulance to treat peripheral nerve-lesions on an expectant plan, postponing nerve-suture until the wounds were healed.

Many brilliant technical operations have given disappointing functional results. The operator, besides contending with the uncertainties of nerve-suture has had to correct accompanying deformities, and struggle against muscular degeneration. From the first a suitable apparatus should be applied to relax the paralyzed muscles, and protect them from strain. Measures should also be instituted to preserve the nutrition of the muscles and maintain their excitability to electrical stimulation.

Musculospiral injuries. The basic principle underlying the physiological treatment of this lesion is the use of an adjustable splint to hyperextend the hand, and abduct the thumb, the arm being supinated. This is accomplished by a Jones "cock-up" splint, or Tuffier's moulded aluminum splint. The hyperextension counteracts the continuous effect of gravity, relaxes the paralyzed extensors, and stretches the flexors, thus restoring the muscular balances, and preventing the occurrence of a contracted drop-wrist. The wrist is kept in this position until voluntary power is restored.

Ulnar injuries. The fingers are spread apart, the first phalanges flexed, the second and third extended, the thumb abducted.

Median injuries. The hand and fingers are strongly flexed, the thumb abducted and flexed, the arm slightly rotated.

Circumflex injuries. Paralysis of the deltoid is combined by abducting the arm.

Injuries to the external popliteal and musculospiral nerves. The foot is placed in a position of strong dorsal flexion and eversion.

The conclusions are as follows:

1. Damage to an important peripheral nerve is an injury of extreme gravity.

2. Primary nerve-suture is rarely indicated.

3. Unrelieved, overstretched, muscular tissue leads to fatty degeneration and loss of contractility.

4. A paralytic deformity with shortened muscle and limited joint movement, in the majority of cases, is the result of ignorance or neglect.

5. It is imperative, whether the nerve is divided or not, that the paralyzed muscles be relaxed and protected from strain by a suitable apparatus. Under no circumstances must this be deferred to the so-called after-treatment. The postural prophylaxis begins with the reception of the wound, and continues after the operation until voluntary motion is restored. A strict adherence to this vital orthopedic principle aids in the diagnosis, hastens recovery, prevents many distressing deformities, and will materially diminish the number of useless limbs.

6. This essential principle has not received the attention from the general profession which it deserves.

Marie, P., and Folz, C.: *Operative Indications Furnished by the Histologic Examination of Nerves Injured in War* (*Indications opératoires fournies par l'examen histologique des nerfs lésés par plaie de guerre*). *Presse méd.*, 1916, p. 41.

The authors consider that histologic study of injured nerves will to some extent dissipate the indecision which at present exists among surgeons as to the desirability or otherwise of operating in the case of injured nerves. Not only this, but such examination will point to what type of operation should be followed. Histological examination will in fact show not only the probabilities of regeneration in a damaged nerve but also the conditions in which this regeneration can best be affected. It therefore furnishes important indications on the choice of operation and on the technique.

The authors give the histologic findings from their examination of the most usual and essential types of nerve lesion from specimens removed by operations carried out during the war. Each type is illustrated.

A. Goss.

Dejerine and Mouson: *The Diagnosis of Complete Interruption of the Great Nerve-Trunks of the Limbs* (*Le diagnostic de l'interruption complète des gros troncs nerveux des membres*). *Presse méd.*, 1916, p. 57.

In previous articles dealing with war injuries of the great nerve-trunks the authors have referred to the necessity of establishing a classification of such lesions founded on the clinical aspects of the syndromes observed. Thus they distinguished a syndrome of interruption, a syndrome of compres-

sion, a syndrome of irritation, and a syndrome of restoration. The authors are now convinced that clinical examination can give precise results in the diagnosis of these different syndromes.

In addition to the usual syndromes such as muscular atrophy, nerve and muscle reactions, and disturbances of the reflexes, there are other symptoms of primary importance: (1) the complete paralysis of all the muscles innervated by the injured nerve; (2) the atony of these same muscles; (3) the absence of sensation on palpation of the muscles and nerve below the lesion; (4) disturbances of cutaneous, osseous, and articular sensation.

The authors describe in full detail the findings in (1) radial paralysis; (2) paralysis of the median; (3) and paralysis of the ulnar. Typical nerve lesions are described under each heading. The authors conclude that a full and minute neurological examination is necessary before a complete interruption of a peripheral nerve can be clinically established. Such an examination gives precise indications on which surgical procedures may be based; and during the course of an operation it also allows the rapid and clear interpretation of lesions concerning which there would be embarrassment in deciding without such examination.

The clinical examination cannot obviate the anatomic and operative examination of lesions; it can determine nothing as to the manner in which a completely sectioned nerve cicatrizes; but it is indispensable in the interpretation of the lesions and in supplying the indications for operation.

W. A. BRENNAN.

Thilenann, H.: *Unusual Early Reappearance of Function in Resected and Reunited Nerves* (*Ungewöhnlich frühe Wiederherstellung der Leitungsfähigkeit im resezierten und gelähmten Nerven*). *München med. Wchnschr.*, 1915, No. 15.

An exceedingly interesting and unusual case is reported of a gunshot wound of the sciatic nerve above the bifurcation, followed by complete paralysis of the leg. The wound canal healed entirely aseptically, but owing to excruciating pain, a resection of the nerve and the surrounding scar tissue was performed four weeks after the injury.

As early as the end of the second week after the reunion of the nerve, the patient noticed that he could move his toes. On removal of the plaster-of-Paris bandage, three weeks after the operation, it was noticed that the leg and toes could be moved actively. The mobility in the leg progressed rapidly so that the patient was able to walk on crutches after four weeks. Three months after the operation, the leg appeared apparently absolutely normal in regard to the muscle functions.

A. STRIMLING.

Auerbach, S.: *Galalith in Nerve Tubulization* (*Galalith fuer Tubulization der Nerven*). *München med. Wchnschr.*, 1915, No. 43.

As material for tubulization, the author uses a substance called galalith, a casein product manu-

factured after a patented process. It is characterized: (1) by easy sterilization (5 minutes boiling in water); (2) by being easily absorbed; (3) by not causing any foreign body reaction; (4) by its low price.

Immediately after boiling, the tubes become so soft that they may be easily cut open lengthwise so as to receive the implanted nerve. As soon as the tubes are placed, they are closed by catgut sutures. The author believes this material can be strongly recommended for tubulization. A. STEINDLER.

Dumas, R.: Freeing of Nerves and Functional Recuperation (*Liberation des nerfs et récupération fonctionnelle*). *Bull. Soc. de chir., de Par.*, 1916, xlii, 171.

Dumas in continuation of previous reports on the treatment of nerve wounds presents his operative technique. In some respects this follows the usual procedure but there are some points of originality. There is a distant freeing of the nerve, a long cutaneous incision, which extends very much above and below the cicatricial zone; search for the superior end of the nerve and dissection of it from above down to its entry into the sclerous tissue; search for the inferior end and a similar working up to the inferior

pole of the sclerous zone. Then instead of seeking to dissect the nerve in the sclerous tissue, the whole sclerous mass is dissected until healthy muscular tissue is reached. If the section of the nerve is clinically incomplete, there is usually found some reaction neuroma more or less exuberant. Extirpating the exuberance the freed nerve is placed in fatty tissue following the method already described by the author. If the section is complete the tissue which holds the two ends is reconstructed, and this constitutes a veritable bridge between the nerve-fibers of the central extremity and of the peripheral extremity. Experience shows that even in the worst cases where there is a break of 5, 6, or even 8 cm. of the two ends the re-establishment of nerve function can be realized.

The disadvantages of the method, particularly injury to neighboring vessels are discussed. Dumas has made actual intervention as follows: ulnar 142; median 133; (in 48 cases the two lesions coexisted); radial 119; sciatic 88; brachial plexus 30.

No cases of motor recuperation after section and suture of a nerve is reported, but probably this is a matter for the future. The author claims excellent functional results in lesions of the median, ulnar, radial, and sciatic nerves. A. Goss.

MISCELLANEOUS

CLINICAL ENTITIES — TUMORS, ULCERS, ABSCESES, ETC.

DaCosta, J. C., Jones, J. F. X., and Rosenberger, R. C.: Tanners' Ulcer. *Ann. Surg.*, Phila., 1916, lxi, 155.

The authors call attention to the numerous callings which are designated *dangerous occupations* on account of the mental or physical strain, contamination of air, direct contact with irritants and poisons, or to liabilities to injuries more or less grave to which the workers are subjected. They note that the suicide rate is a fair measure of the strain of an occupation, though not necessarily of the dangers attending it.

Among the dangerous callings due to irritants and poisons, those which employ chrome salts are of considerable importance. Chromic acid and its salts, in some form, are used in photography, in calico printing, in bank-note printing, in the ceramic industry, in the manufacture of safety matches, dyeing, glass-making, bleaching oils, and tanning hides.

The authors have given a brief résumé of the literature upon "chrome sores" from Christison's first description in 1829 down to the present day. There have been a number of cases of acute and chronic poisoning from chromium salts reported, and to these the authors have added 44 cases, 19 of which have been carefully observed and are given in some detail. In practically all of their cases the

ulcerations have been kept wet by chromate solution. Healing is not to be expected as long as the patient continues to work. The chief characteristics of the ulcers are induration, pain, and a tendency to deep penetration, some of them entering joints or even bones. The ulcers usually result from an exposed excoriation, and hence usually have the shape of that breach in the continuity of the skin. A green or grayish core or slough forms in the center of the ulcer and separates, leaving perpendicular edges, unless there is an accompanying severe pyogenic infection. The floor of the ulcer is pale pink or pale gray. The discharge is usually thin, scanty, and purulent. The parts about the ulcer are densely hard, and the induration, though never narrow, is greater or less in direct proportion to the depth of the ulcer.

Healing occurs under crust formation as a rule. The parts near a healing ulcer are pearly white as are the scars of the healed ulcers. Patients are tortured day and night, often not being able to sleep on account of the extreme pain and severe itching. The ulcers will never heal unless protected by some impervious material, and even with absolute rest, recovery usually takes weeks.

The authors take up the question of prevention of the ulcers and discuss the various methods which have been proposed and are in use. All of the methods depend upon rendering the skin and, particularly, abrasions impervious to the attack of the chrome salt. GATEWOOD.

Lathrup, A. F. C., and Loeb, L.: Further Investigations of the Origin of Tumors in Mice, and on the Part Played by Internal Secretion in the Spontaneous Development of Tumors. *J. Cancer Research*, 1916, 1, 1.

This present contribution was undertaken by the authors in an endeavor, on the basis of all previous studies on the heredity of cancer in mice, not only to analyze the factors contributing to the origin of cancer, but also to acquire if possible means of preventing the spontaneous development of malignant tumors in mice.

Their work may be summarized as follows:

1. Castration of female mice below the age of six months leads to a very marked decrease in the cancer incidence of these animals, although the authors have not so far succeeded in preventing cancer altogether under these conditions.

2. The cancer age is increased in castrated female mice.

3. Castration in mice above the age of six months has so far been without effect.

4. The prevention of breeding in female mice decreases the cancer incidence and increases the cancer age, though to a much smaller degree than does castration.

5. Non-breeding female mice reach a higher age than breeders.

These results are interpreted as due to the influence of the corpus luteum on the growth of the mammary gland, and as the first experimental demonstration of internal secretion as an etiological factor in the spontaneous development of cancer. The chemical action is superimposed upon a hereditary factor distinct from the former.

GEORGE E. BEILBY.

Mowers, S. W.: Review of the Present Status of the Treatment of Cancer. *Northwest Med.*, 1916, 11, 35.

Reviewing the present status of the frequency of cancer the author calls attention to the fact that we are yet in ignorance as to the ultimate cause of cancer. During 1913, in the registered areas of the United States, comprising per cent of our population, 75,000 people died of cancer, an increase of 12.2 deaths per 100,000 during 10 years. This increase may possibly be due to improved diagnosis, or to the fact that a larger percentage of people now live to reach the cancer age. Serums, vaccines, and toxins have so far failed to cure. Coley's serum forms the one exception, wherein a certain number of cases, a small percentage, have been either cured of sarcoma or been temporarily benefited considerably. Exposure to X-ray of a moderate degree of intensity results in a stimulation of the growth, whereas the heavier exposure may cause a regression or apparent cure in a superficially lying carcinoma. The deeper processes are less favorably influenced by this treatment. The author quotes McKee as favoring single massive doses rather than divided milder exposures.

Radium has about the same sphere of usefulness and treatment as X-rays, namely, superficial growths are greatly improved or cured, whereas the deeper ones are not influenced to such a marked degree. As yet it is a little early to form any opinion as to its true value. Fulguration also has been advocated in the treatment of superficially lying growths. However, its application is limited. Surgery is the safest and surest method of curing the disease. The experiments by Jensen in 1900, showed that the cells of cancer are not a proliferation of normal tissue cells but spring from one another, and that if the growth is early removed completely, cure results.

The author quotes Bainbridge's advice in the surgical technique of cancer operations. No instrument should be used twice without sterilization because of the danger of reinfection from them. Tumor mass ought to be carefully handled in the dissection so that the wound may not become contaminated from cells disseminated at the time of the incision. All manipulations of the tumor and the cancer-bearing tissues should be carried out with the greatest care and gentleness. Block dissection of the mass and its draining lymphatics should be made, starting the excision with the glands and taking out the tumor last, because of the lessened liability of squeezing out the tumor-cells into the draining lymphatics when this procedure is adopted. There should be as little trauma as possible to the tissues surrounding the growth at the time of operation. Severed lymph-vessels should be twisted off to prevent further lymphatic infection. Drainage tubes and tension on the wound are to be avoided and in ligating the vessels fine catgut, which is quickly absorbed, will be found to give the least irritation to the wound.

HARRY G. SLOAN.

Hoffman, F. L.: The Mortality from Cancer in the Western Hemisphere. *J. Cancer Research*, 1916, 1, 21.

Hoffman presents a very exhaustive and statistical study of cancer and its mortality viewed from the standpoint of age, sex, climate, race, and of the various organs and tissues of the body that are most frequently involved. His observations seem chiefly intended to emphasize the urgency and practical utility of further statistical research into the geographical incidence of cancer throughout the Western Hemisphere. Conceding the rather doubtful accuracy and completeness of the returns from certain countries and islands largely inhabited by native races, it nevertheless seems to the author reasonable to maintain that if malignant disease were actually as common in these areas as in the more civilized portions of the globe, the recorded rate of frequency would be much higher than is actually the case.

In contrast to the comparative rarity of cancer in many of the countries and islands of Central and South America, this discussion draws attention to the excessive frequency of the disease in such

cities as Buenos Aires and Montevideo, where it has been shown that cancer is even more common than in cities of corresponding size in the northern portion of the Western Hemisphere. In this direction also the author believes that the outlook is so encouraging that further statistical research, amplified by medical and anthropological studies, and most of all by thoroughly qualified studies of metabolism, diet, and habits of life, would yield results of considerable practical importance. Accepting as conclusive the recorded rate of excessive cancer frequency for many of the countries and states of the Pan-American Union, it would furthermore seem to the author of the utmost urgency that the attention of these countries should be directed to the principles and methods of the American Society for the Control of Cancer, as a first step in the direction of an effective public education in the essential cancer facts and a prerequisite for an ultimate reduction in the mortality from malignant disease throughout the entire Western Hemisphere.

GEORGE E. BEILBY.

Rockey, A. E.: The Cause of Carcinoma. *Surg., Gynec. & Obst.*, 1916, xiii, 171.

Rockey proposes the hypothesis that cancer is caused by a defensive process of the tissue-cells to a great variety of irritations; and that there is no specific external cause for cancer. There is a normal antagonism between cells that are of mesoblastic, and those of epiblastic, origin; which prevents them from intermingling under the ordinary circumstances of wound healing.

The defensive reaction to any irritation that falls short of the destruction of cells is an active karyokinesis. The more active this becomes the more nearly the cells approach the embryonal type and become irregular in their mitosis. This irregularity is the result of the struggle for existence, in which they fail to produce perfect cells. This is true both of the epithelial and connective-tissue cells. Like allies in common defense; these young and actively growing cells lose their normal antagonism for each other and more readily mingle. The young epithelial cells become engulfed in those of the connective tissue; and lose their proper position on the surface. The environment which makes for normal development of the cells is lacking. They belong on the surface; and cannot in the depths of the tissues attain anatomic perfection, and physiologic activity. They retain the excessive karyokinetic tendency of their immediate progenitors; and can only grow and reproduce. This tendency, which was at first a defense growth against the irritation which destroyed the basement membrane, thus produces cancer.

There can be no single external specific cause, either microbic or protozoan, for cancer, which has its origin in such a variety of irritations as those found in smokers' cancer of the mouth and lip, betel-nut chewers' cancer of the mouth, chimney-sweeps' cancer, and cancer produced by X-ray

irritations, slow burns, as those of the abdominal wall in the natives of Thibet; cancer of the stomach following ulcer, or those of the colon and rectum at the dependent portions, where fecal accumulations produce chronic irritations. All such irritations may, when they are of sufficient intensity to destroy the basement membrane, provoke a defensive reaction in the cells, which reduces them to an embryonal form, and karyokinetic activity diminishes their normal antagonism to each other, and thus causes cancer.

Woglom, W. H.: Intratesticular Implantation of the Flexner-Jobling Rat Carcinoma. *J. Exp. Med.*, 1916, xiii, 189.

Woglom points out that the propagable tumors of rats and mice proliferate in practically all the organs of the body, including the testis, although the transplantability of the Flexner-Jobling rat carcinoma into this gland had not been definitely proved until the author was able to demonstrate it in the experiments which form the basis of this paper. In a series of transplantations he demonstrated that the inoculation percentage of the Flexner-Jobling tumor into the testis was almost equal to the subcutaneous inoculation percentage and that subcutaneous and intratesticular grafts in the same rat generally tended to fail or succeed together.

However, the author states that although grafts do succeed in proliferating in the testis, the resulting tumors do not attain quite the dimensions of those growing in the subcutaneous tissues. The reason for this he cannot explain.

He does not believe that the smaller size of intratesticular nodules can be explained solely by the pressure to which they are subjected during their growth, but that other factors, which cannot be determined, appear to be concerned.

GEORGE E. BEILBY.

Jones, F. S.: A Transplantable Carcinoma of the Guinea Pig. *J. Exp. Med.*, 1916, xiii, 211.

Jones was the first to report on the transplantation of a tumor in the guinea pig. The tumor which he transplanted occurred in the mammary gland of an old female guinea pig which, judging from the condition of the breast, had recently suckled offspring. Bits of the peripheral layer of the tumor were inoculated by means of a trocar into the subcutaneous tissue of the groin and into the muscles of the upper leg of sixteen young guinea pigs, most of which were between two and three weeks old. Animals of this age were chosen because it has been frequently shown that young individuals are especially favorable hosts for tumor-grafts.

Sections of the original tumor showed it to be a carcinoma, and the transplanted tumors were likewise of the same nature.

Summarizing his results the author states that an adenocarcinoma of the mammary gland of an old guinea pig was successfully transplanted through eight successive series of animals. It appeared

that they grew much earlier and more rapidly. The number of takes also was increased. In two instances metastasis to the regional lymph-glands (inguinal) was observed. Once microscopic metastases were found in the kidney. The so-called precancerous changes observed in the breasts of women and mice suffering from mammary carcinoma were found in the mammary gland of the spontaneous tumor animal. GEORGE F. BRIDAY.

Nurum, J. W.: Needleless Surgical Operations from Failure to Recognize Tabes Dorsalis. *J. Am. M. Ass.*, 1916, LVI, 483.

Of 1,000 tabetics, 8.7 per cent have been subjected to laparotomy under mistaken diagnoses one or more times.

The "crises" of tabes have largely influenced the surgeon in his decision to operate. This statement is supported by the fact that 65 per cent of the 87 patients operated on presented visceral crises. In 17 per cent of these, the crises were the initial symptoms of the disease.

Mistaken diagnoses and resulting operations occur chiefly through failure to examine the nervous system.

Gastric ulcer, gall-bladder disease, and appendicitis are the diagnoses most frequently made.

Tabetics subjected to several successive laparotomies have, as a rule, been operated on by as many different surgeons.

A history of paroxysmal attacks of vomiting, rheumatism, parasthesias, bladder disturbances, or fractures without physical violence should excite interest to exclude tabes dorsalis.

The cytodiagnostics of the cerebrospinal fluid, together with the Wassermann reaction with the spinal fluid, are of inestimable value in doubtful cases. EDWARD L. CORNELL.

Seelig, M. G., and Joseph, D. R.: The Condition of the Vasoconstrictor Center During the Development of Shock. *J. Lab. & Clin. Med.*, 1916, I, 281.

Seelig and Joseph are interested in the consideration of the view, which has been accepted too generally and upon insufficient evidence, that in surgical shock the primary cause of all the other symptoms is a preceding paralysis of the vasomotor center. The problem which they set for themselves was this: Can there be obtained any conclusive evidence that during the development of shock the vasoconstrictor center at any time loses its activity? If indisputable evidence is to be obtained that the activity of the vasoconstrictor center persists for a long time and even after many of the other manifestations of shock are present, then it can be stated definitely that shock is not the result of a breakdown of the vasomotor center, but must be due to some other cause or causes.

They selected for their experimental investigation the ear vessels of white rabbits. This region seemed ideal: first, because the vessels can be seen

distinctly and the caliber can be observed directly and compared with the caliber of the vessels of the other ear; secondly, because the vessels are subjected to no direct interference of any kind; thirdly, the course of the vasoconstrictor nerve-fibers has been well worked out, so that one can be sure that the vessels of the control ear have really been disconnected from the medullary center.

The problem was attacked according to the following plan: If the vasoconstrictor nerves to one ear are cut, all influence of the vasoconstrictor center over the vessels of that ear are removed. The denervated vessels might then be expected to react more or less passively to changes of pressure within them. If the heart were maintaining high blood-pressure these vessels should become passively dilated. If, on the other hand, the blood-pressure were low, they would be correspondingly less dilated. In other words, the vessels of the denervated ear would react passively to the blood-pressure within them, without reference to the vasoconstrictor impulses arising outside the vessels.

The method employed was as follows: The vessels of one ear were denervated by resecting and severing, under ether anesthesia, the auricularis magnus nerve at the base of the pinna and removing the superior cervical sympathetic ganglion on the same side. In no case was the animal reduced to a state of shock immediately following the denervation of the ear. At least twenty hours elapsed between the two operations and in some cases there was an interval of several days. The purpose of this delay was to avoid the effects upon the denervated vessels of immediate stimulation of vasodilator or vasoconstrictor nerve-fibers consequent upon the operative procedures at the time of the denervation. After this interval, the animal was again etherized and reduced to a state of shock.

Twenty-five experiments were performed in this series. The interval between denervation of the blood-vessels of one ear and the production of shock varied from twenty hours to twelve days. This interval was allowed in order to secure a proper set of control vessels, affecting in no way the vessels of the normal ear directly.

The authors summarize their conclusions as follows:

1. Denervated blood-vessels usually show the best passive response to internal pressure changes when used within twenty-four hours after their denervation.

2. Normally innervated ear-vessels are strongly constricted while the animal is sinking into a condition of shock and after shock has developed.

3. This strong vascular constriction persists even though the blood-pressure be raised well toward the normal level (at a time when the animal shows distinct symptoms of shock).

4. This vasoconstriction is due to the activity of the vasoconstrictor because (1) the denervated vessels of the other ear become strongly dilated under the influence of the same pressure and (2) the

constriction of the normal vessels themselves disappears at once if their connection with the vasoconstrictor center is destroyed by cutting the nerves, or by abolishing their conductivity with ether or by freezing.

c. Since a fairly high degree of activity of the vasoconstrictor center can be demonstrated even after the blood-pressure has fallen to a low level and reflexes are sluggish, it is justifiable to conclude that a paralysis or failure of the vasomotor center is not the primary cause of the other symptoms of surgical shock.

ALBERT EHRENFRIED.

BLOOD

Phocas, G., and Portocalla, A.: Prognosis in Surgery Based on the Opsonic Index (*L'opsonie pronostic en chirurgie*). *Arch. de med. exp.*, 1916, XXVII, 123.

In discussing this subject the authors point to the irregularity with which infections appear in different patients after operation. Some even after long and severe surgical procedures go on to recovery without incident; others even after a slight intervention are subjected to most unfortunate consequences. The authors' aim is to seek a reason for this. The outbreak of post-operative infective phenomena does not depend alone on invasion by germs. If infection exists which the individual is unable to combat, in the great majority of cases they are slight infections produced in the course of the operation. Everything depends on the condition of resistance of the operative field, and the measure of this resistance to infection may be estimated by securing the opsonic index of the patient.

The authors suggest that a patient may very easily become infected from operative room sources when his resistance is low and that such infection is capable of producing all the post-operative accidents which occur. They have studied the opsonic index in the case of 36 operated subjects. The test of resistance was made with the staphylococcus only. Blood from the patient was obtained under the same conditions in all cases, usually on the day of operation. From the results it is evident that there is an agreement between the value of the opsonic index and the resistance to infection.

While the authors cannot draw any conclusion as regards the value of the opsonic index in determining the nature of the disease, yet it is noteworthy that tuberculous subjects have shown a very high index. Below a certain index infective accidents are the rule. No matter what may be the value of the index asepsis must still be the basis of surgery. When the index is very low additional care must be taken to shorten intervention and obviate its hardships.

Regarding preventive inoculation to raise the value of the opsonic index the authors do not think that such therapeutic measures have given the results expected from them.

W. A. BRENNAN.

Woolley, P. G.: Fetal Erythroblastosis; Fetal Erythroblastomatosis. *J. Lab. & Clin. Med.*, 1916, I, 347.

Fetal erythroblastosis is one member of the group of congenital general edemata, and is characterized by the following features:

1. The fetuses—premature as a rule—show universal edema in the form of anasarca and hydrops of the body cavities.

2. Most of them show also edema of the placenta and cord.

3. The liver and spleen are markedly enlarged.

4. Microscopic examination of the liver and spleen show massive accumulation of unusually large numbers of erythroblasts with other myeloid cells, inside and outside the vessels. Also the liver-cells are atrophic and in the spleen the follicles are absent. In other organs, especially in the kidneys and lymph-nodes, extramedullary erythroblastic nodules appear, and the blood shows enormous numbers of erythroblasts overshadowing all other elements. Mitotic erythroblasts are frequent.

All of these characters were shown in the case reported. In addition to the other data it was interesting to note that the affected infant was one of a pair of twins. The other twin was normal. This fact disposes of the supposition that the disease is due to maternal metabolic disturbances, such as appear in nephritis, or to maternal infection. Attention is called to the possibility that the complex belongs to the neoplasms, in which the erythroblastic tissues are affected. The term "erythroblastomatosis" is suggested to indicate this relation.

Kahn, M.: Metabolism Studies in Hæmophilia.

Am. J. Dis. Child., 1916, XI, 103.

The two cases studied were of different types of hæmophilia, both in boys. One gave a typical history of hereditary hæmophilia; the other was not a hereditary "bleeder." In both of the cases it was found that there was delayed coagulation of the blood. In the case of atypical hæmophilia the lime in the blood was found to be normal; whereas in the other case the calcium content was decreased.

The protein metabolism as measured by the nitrogen and sulphur output, in the case of the two hæmophilic children, was similar to the nitrogen and sulphur metabolism in the 5-year-old boy studied by Schwartz. The absorption, retention, and excretion were about the same, and the partition of the nitrogen and the sulphur into the various fractions gave normal average results.

Compared with the normal boy, the excretion of calcium in the urine, as compared with the excretion of calcium in the faeces, was about the same in both the hæmophilic patients. In the case of hæmophilia calcipriva, there was a negative calcium balance in the fore-period, a positive calcium balance in the lime-feeding period, and a decreasingly positive calcium balance in the after-period. The mineral metabolism in the true hæmophilic appeared to be normal.

From these observations it would appear that not all haemophilia patients present similar pathologico-chemical disturbances. There seems to be no derangement in the metabolism as measured by the intake and output of nitrogen, sulphur, calcium, etc., in the case of haemophilia vera. There are, however, certain "bleeders" in whom the disturbing factor seems to be a lack of calcium content of the blood and an inability on the part of their organisms to properly assimilate the lime from the food. In these cases the remedy indicated would be to administer the lacking mineral constituent in the form of the chloride or the lactate of calcium.

EDWARD L. CORNELL.

Satterlee, H. S., and Hooker, R. S.: Transfusion of Blood with Special Reference to the Use of Anticoagulants. *J. Am. M. Ass.*, 1916, LXVI, 618.

Satterlee and Hooker conducted a series of experiments with a view to determining the best anticoagulative agents for purposes of transfusion.

It has been observed that certain toxic symptoms varying from a slight chill and rise of temperature to marked anaphylactoid phenomena and even death has occasionally resulted as immediate sequels to transfusion and where the usual serologic tests for hemolysis and agglutination have been entirely favorable. In explanation of these phenomena three hypotheses are to be considered:

1. It is possible that the trypsin-antitrypsin balance in the circulating blood of the recipient may be so disturbed by the commingling with the donor's blood as to result in the immediate formation of serotoxin from cleavage of serum protein.

2. It is possible that the action of protective colloids in the body cells of the recipient may be so disturbed that these cells are thereby exposed to a reaction of antigen and antibody present in the circulation of the recipient but harmless to the protected cell.

3. The possibility of a toxic disturbance in the circulation of the recipient by the introduction of blood which, though perfectly fluid, may nevertheless be undergoing incipient coagulative changes due to the physical influences to which it is subjected in process of transfer.

The mechanism of toxic action as suggested by the last theory is significant in connection with the physical influence to which the blood is exposed by the method of transfusion. Defibrination is, of course, an extreme degree of physical violence, but the argument of toxic effect from incipient coagulative factors applies, *pari passu*, with the lesser forms of physical violence which are incident in varying degree to any method of transfusion which is not a direct anastomosis. Accordingly the authors conceive that the rational and most desirable function of an anticoagulant is to restrain incipient coagulative changes at the zones of foreign contact, where such changes are most liable to occur.

After a consideration of paraffin, hirudin, and various inorganic salts, by a process of elimination

only sodium citrate and sodium metaphosphate remained for consideration. It having previously been found that the pipet-cannula method affords a technique which permits the use of approximately one-eighth of the quantity of hirudin which is necessary to produce an equal anticoagulative effect when using the simple syringe method, a similar advantage is shown, by the present experiments, to hold true with sodium citrate. In coating the pipets with this anticoagulant 20 to 30 ccm. of a 10 per cent solution of sodium citrate is poured into the pipet just previous to use. This fluid is thoroughly flowed over the interior of the pipet by rotating it in the horizontal position and all excess is then allowed to drain out through the tip, leaving approximately 1 ccm. of the solution, which adheres as a thin film to the glass wall of the cylinder. The authors found that 100 mg. of sodium citrate (1 ccm. of solution), when so used as a liquid coating in one of their pipets, was amply sufficient for the purpose of transfusing 250 ccm. of blood when used with their cannulas, and that the only fully citrated blood so treated was that small residual portion (about 12 ccm.) which was retained in the pipets. Therefore, it is evident that not more than 38 mg. of sodium citrate per 100 ccm. of blood is necessary for transfusion by this method.

During six months the authors have used sodium citrate as an anticoagulant with the pipet-cannula apparatus in clinical practice, and are well satisfied with its practical operation.

Their findings may be summarized as follows:

1. A better knowledge of the physicochemical changes which may occur in the blood of the recipient is needed in order to define more clearly the rational indications for transfusion.

2. Hypotheses are suggested to explain the occurrence of febrile and toxic reactions following transfusions which cannot be foretold by the existing tests for compatibility.

3. The theory is advanced that many of the febrile and toxic reactions, not to be explained by hemolysis or agglutination, are due to incipient coagulative changes in the transfused blood which thus contains potential coagulative factors such as thromboplastin and thrombin.

4. The employment of leech extract or commercial "hirudin" is subject to uncertainty of action and possible danger from contamination with toxic substances.

5. The use of paraffin is theoretically the method of choice in providing an anticoagulant agent for purposes of transfusion, and has been found practicable, but not without certain precautions and proper apparatus.

6. Of the inorganic calcium-converting agents investigated, the citrate of sodium and the metaphosphate of sodium are the only substances which exhibit desirable characteristics. Both of these salts, however, have toxic effects which demand consideration of the amounts which can be safely employed for purposes of transfusion.

7. Sodium citrate in the proportion of 120 mg. to 100 cc. of blood, when used with the pipet-cannula apparatus and in the manner described, serves as an effective anticoagulant for transfusion. This proportion (0.04 per cent) is from one-fifth to one-twenty-fifth of the amount of citrate necessarily employed with other methods. Because of the considerations discussed, the authors believe it to be the best method for general use.

ALBERT EHRENFRIED.

Pope, S. T.: The Results of Thirty-five Transfusions. *Calif. St. J. Med.*, 1916, xiv, 66.

Pope reports 35 cases of transfusions. In the majority of the cases the transfusion was done by the use of two glass tips connected by a flexible rubber tube, paraffined throughout. The flexibility of the tube is a decided advantage in adjusting the cannula, making it unnecessary to dissect out the vessels. In 5 cases the syringe method of Lindeman was used and proved entirely satisfactory.

It was found that citrate and salt solution used freely on the exposed blood-vessels during the entire operation was much more efficient in maintaining the antithrombin-prothrombin balance than a protective coating of petrolatum.

It is undoubtedly advisable to have prospective donors on whom blood studies have been carefully made. In one instance the donor had a streptococcus angina, later discovered, and the recipient had an immediate chill followed by considerable fever for a few hours. In another case a slight hemolysis occurred, but did no damage.

A summary of these cases roughly establishes the following conclusions:

1. Transfusion has no value in sarcoma or sepsis.
2. Hemophilia is relieved temporarily.
3. A case of von Yacks' pseudoleukemia was relieved of the anemia and the recovery apparently hastened.
4. In typhoid fever with hemorrhage, transfusion stops the bleeding abruptly and is of great value. It should be a routine measure in such cases, the indirect method being used and, if possible, having a donor with acquired immunity.
5. In purpura and severe urticaria it is almost a specific; one case of purpura, however, was unimproved.

6. In hemorrhage and preliminary to major surgical operations upon the debilitated it is a life-saving procedure.

In this series of cases transfusion saved the life of at least one-fourth of the cases. J. W. TURNER.

BLOOD AND LYMPH VESSELS

Skillern, P. G. Jr.: Treatment of Varicose Leg Ulcers. *Ann. Surg.*, Phila., 1916, lxxii, 176.

After discussing the various methods of treating varicose ulcers of the leg, the author concludes that there is no virtue in such fads as scarlet red and

basic fuchsin ointments. He states that when reduced to its simplest terms, the rational treatment depends upon the recognition and application of the following principles: (1) protection of the regenerating epithelial edge of the ulcer; (2) drainage of the discharge from the ulcer; and (3) support of the venous channels from without, thus neutralizing the baneful effects of chronic venous congestion. The rational treatment, therefore, may be summarized as the "rubber-tissue-dry gauze-muslin bandage method." In selected cases he believes that the adhesive-plaster strapping method with calomel applied as a dusting powder is an efficient method of effecting a cure, while for the routine treatment of the average case Unna's zinc-oxide-gelatin paste stocking serves as an admirable support for the venous channels.

GATEWOOD.

Homans, J.: The Operative Treatment of Varicose Veins and Ulcers, Based upon a Classification of These Lesions. *Surg., Gynec. & Obst.*, 1916, xii, 143.

The author discusses the physiologic and pathologic conditions underlying the establishment of varicose veins of the legs, and attempts to classify them for purposes of treatment. His classification is based upon Trendelenburg's tests, and he divides cases of varix into two groups: (1) pure surface varix, and (2) surface varix complicated by varicosity of the perforating veins.

The first and largest group arises usually from hard work and heavy lifting in men, and from child-bearing in women. The surface veins are large, dilated, and tortuous. Ulcers when present usually lie directly upon a varicose vein. The perforating veins fulfill their rôle of safety valves by conducting the stagnant blood from the surface to the deep veins. Appropriate operative procedures include high division of the great saphenous trunk in the aged or infirm, i.e., as a palliative measure, but the operation to be generally advised is excision of the great saphenous trunk from groin to mid-calf.

The second group is smaller and includes some cases of similar etiology to the first, but in which the perforating veins are varicose, allowing blood to leak from the deep veins into the already overburdened surface vessels. The group is chiefly composed of post-phlebotic varix, a condition dependent, in Homans' opinion, upon the sudden breaking down of valves and thickening of the vein walls without dilatation. The perforating veins are nearly always involved in this process. Under these conditions, widespread ulceration and edema of the leg are common and are difficult to treat. Operation includes the radical removal of the varicose surface vessels and a search in the lower leg for the varicose perforating veins by various appropriate technical methods. Ulcers are best excised and skin-grafted at once.

The article is illustrated by diagrams and a number of photographs illustrative of types of varicose veins and their appropriate treatment.

Makins, G. H.: *The Vascular Lesions Produced by Gunshot Injuries and Their Results.* *Brit. J. Surg.*, 1916, 10, 422.

The experience gained from the South African and succeeding wars would indicate that injuries to blood-vessels due to missiles were usually isolated and neatly penetrating. During the present war, however, the missiles are often so ragged in contour or so unstable in their flight that greater destruction of tissue results and hence greater laceration to the vascular structures. The high explosive shell, which furnishes a large number of ragged, sharp fragments is largely responsible for the increased severity of these wounds. Traumatic aneurisms have become comparatively common.

Contusions of arteries may result in thrombosis even though the vessel has been merely contused or a part of the external coat carried away, leaving the intima and muscularis *in situ*. This has been observed many times, even in the absence of infection. The thrombosis thus produced may be very limited or very extensive. The thrombus may produce extensive primary gangrene, may be followed by secondary hemorrhage, or may be the source of emboli. Secondary aneurism probably results as a later development in many of these cases of incomplete lesions of arteries. Infection plays a great part in the causation of secondary hemorrhage from arteries so injured, and seems to result more frequently in hemorrhage than in those wounds where the vessels have been completely divided and the ends have retracted to a comparatively safe distance from the infected field.

Thrombosis as a result of contusion to veins is even more apt to occur than in the case of arteries. It often results from a much slighter contusion than that necessary to produce thrombosis in an artery.

Arterial embolism may follow an incomplete thrombosis. Although more apt to occur in the presence of infection it has been shown to occur primarily where the thrombus did not completely occlude the artery.

The wounds of the vessels are usually ragged in contour, the edges only becoming rounded smooth during the process of repair or the formation of an aneurism. The introduction of the unstable pointed bullet has increased the number of cases of complete severance of the vessel. In fact, perforation of an artery has been observed in only three cases by the author. Veins, however, are more frequently transected.

Primary hemorrhage usually results in spontaneous cessation unless one of the largest vessels has been wounded. An abundant spurt of blood usually results immediately after the reception of the wound, but usually this can be stopped by pressure or by application of a dressing. However, the loss of blood is often very considerable and may seriously handicap the patient's recovery should an operation become necessary. Secondary hemorrhage is a frequent sequence of infection and especially follows wounds of small vessels.

Aside from external hemorrhage, a wound of a vessel is most apt to produce a hematoma. This hematoma may be partially clotted and later infection may lead to secondary hemorrhage. A false aneurism is also apt to form opposite the opening in the vessel by the hollowing out of the hematoma. These false aneurisms become smooth-walled and lined by a glistening membrane with the appearance of endothelium; the walls become laminated and later change to a fibrous tissue.

The tissues around a false aneurism behave in such a way as to limit the extension of the aneurism. Fibrous tissue infiltrates the intermuscular spaces and forms a limiting structure around the aneurism. The result is often hard scar tissue which makes operation difficult for the repair of the artery but which acts as an effective material barrier to the extension of the hematoma and false aneurism.

The obvious local signs of an arterial hematoma or false aneurism need no special description; but two points are of especial importance, i.e., the characteristic arterial bruit and the effect on the general circulation. The presence of the bruit indicates an incomplete solution of continuity—a lateral wound of the wall of the artery; it is in fact a sign of a wounded artery rather than of an aneurism. The systolic murmurs vary greatly in intensity, depth of tone, and musical character. The character of the bruit obviously depends upon the size and shape of the opening in the vessel and the degree of irregularity of its margins. The murmur changes in character as the opening in the vessel wall becomes smoother, the aneurismal sac less irregular, and the pulse more normal. The pulse may be early obliterated because of pressure on the vessel by the effused blood. It is usually rapid early, the heart being dilated and weak. Repeated examinations are often necessary to correctly diagnose a case of incomplete laceration of an artery.

The typical course of an arterial hematoma is one leading to contraction and localization, a false aneurism being the commonest final result. Certain complications, however, occur with some degree of frequency. The most common of these are symptoms dependent on the pressure of the effused blood and clot on neighboring structures, the development of peripheral gangrene, the occurrence of secondary hemorrhage, the detachment of emboli from the thrombus, and very rarely the sequence of inflammation from secondary infection. These complications occur, usually, comparatively early, before a definite false aneurism has formed.

The most common pressure symptom is peripheral edema, especially marked if concomitant injury to the vein has occurred. Pain may be marked if nerves are pressed upon, but usually disappears as the swelling becomes less. Gangrene may result from pressure upon the collateral circulation of the artery involved.

Secondary hemorrhage may occur after two or three days or later—after about ten days. The early form is not often dangerous, but the later

form, after about seven to ten days, is vastly more dangerous. In this latter type, the hemorrhage is often profuse and due frequently to a giving way of the wall of the false aneurism.

Inflammation of the hematoma is a rare occurrence, only two deaths in the whole series being due to infection of the blood clot. The aneurismal sac is the last to become infected, and only occasionally does such a complication occur. However, should it occur, secondary hemorrhage may ensue, and gravely compromise recovery.

Arteriovenous aneurisms are not so common as arterial aneurisms and as a rule are a later development. The manner of formation may be one of several: (1) perforation of both artery and vein may occur; (2) complete division of both artery and vein may lead to aneurism of this type; (3) a lateral wound of the artery may be accompanied by a lesion of the vein; and (4) the vein may be greatly injured and may communicate with the artery only by a very small opening.

The development of an arteriovenous aneurism may be gradual, but an early systolic bruit, which later becomes both systolic and diastolic, is characteristic. A thrill is not evidenced in the early stages but later becomes apparent. It may be very evanescent in character.

An aneurismal varix may result from simultaneous injury of both artery and vein with immediate adhesion between the two, resulting in a definite anastomosis. This anastomosis may be as perfect as if performed by a surgical procedure.

The general treatment of vascular lesions in war should be as conservative as possible. Rest and an expectant attitude give the best results. Ligation of the artery at an early date is to be avoided since the patient is in a state of low vitality and sufficient time has not elapsed for the establishment of a sufficient collateral circulation. Furthermore, collateral branches may be opened up at the operation, may not bleed at the time, and later may lead to secondary hemorrhage.

The large majority of the hematomata eventually become false aneurisms. Here, also, an expectant attitude should be taken and followed for some weeks. Suture of the injured artery is more possible the longer the interval since the injury.

J. H. SKILES.

POISONS

Delbet: Pyoculture and Dakin's Fluid (Pyoculture et liqueur de Dakin). *Bull. Soc. de chir. de Par.*, 1916, xlii, 234.

Delbet continues the discussion on pyoculture in the case of infected wounds particularly replying to the objections raised by Pozzi and Wright, who hold that this particular method of controlling clinical results could only mislead. Delbet's opinion is that while pyoculture alone is never an indication for amputation, it can prevent an unnecessary amputation and this is the interesting point which he has always insisted on that a pyo-

culture properly made and properly interpreted enables the surgeon to avoid an amputation. He mentions cases in his service to illustrate this, where the general indications pointed to amputation, yet owing to a negative pyoculture, amputation was omitted and there was recovery.

The general rule which Delbet has adopted is this: When amputation appears to be indicated by the local and general conditions, he does not decide upon it until the results of a pyoculture are available. If this is abundantly positive he amputates. If the pyoculture is negative or only weakly positive he does not amputate, but follows the condition of the patient day by day, making successive pyocultures. In such cases he has not been obliged to make a secondary amputation, and following his method he has been able to save many limbs. A. Goss.

Laurent, G.: Notes on the Treatment in Eighteen Cases of Confirmed Tetanus (Notes sur le traitement de dix-huit cas de tétanos confirmés). *Lyon chir.*, 1916, xii, 76.

The author reports the treatment of 18 cases of established tetanus. The first 11 cases were treated by antitetanic serum alone or combined either with phenic acid or sulphate of magnesia. In addition 3 of these cases had the tetanus focus surgically removed. All these cases died very soon.

Intravenous injections of neosalvarsan were then tried on a series of cases. The first 3 cases so treated recovered. But in these cases the tetanus was slight and in one there was an accessory amputation. The next 4 cases tried in the same way died.

The author's statistics of recovery, therefore, are no better than the other recovery statistics furnished in the course of the war. A. Goss.

SURGICAL ANATOMY

Well, R.: Chemotherapeutic Experiments on Rat Tumors. *J. Cancer Research*, 1916, i, 93.

In this paper the author discusses only certain phases of the work which he has been carrying on for several years and their bearing upon the general problem of chemotherapy of tumors. He divides the subject into five heads: (1) the penetrability of the living tumor cells; (2) the staining of necrotic areas; (3) the localization of dyes in tumors; (4) the localization of the benzidine dyes; and (5) metachromasia.

In judging of the therapeutic effects, three criteria were employed: the rate of growth of the tumors, their transplantability, and the number of retrogressions. The following summary may be drawn:

1. Living tumor cells are not penetrated by coloidal dyes.

2. The necrotic areas of tumors contain a larger amount of iodine than do the other tissues of the body after the intravenous injection of sodium iodide.

3. The necrotic areas of tumors present an intense discoloration after the intravenous or subcutaneous administration of dyes of the diazo group.

4. The discoloration of these tumor areas is very frequently associated with some discoloration of the liver, while the other tissues of the body remain macroscopically unstained.

5. The staining of the necrotic areas of tumors is not due solely to the death of the cells, inasmuch as areas of pulmonary ematoma in the same rats do not present any discoloration.

6. The localization of colloidal dyes in necrotic tissues is not a simple physical phenomenon, subject to the laws of diffusion of fluids into non-living colloidal material. The diffusibility of the dyes through membranes, as also the electrical charge, the chemical reaction, and the chemical composition of both colloids influence the result.

7. A peculiar alteration in the color of dyes of the benzidine group occurs in necrotic areas. This has been described as metachromasia.

8. A series of new synthetic compounds analogous to Congo-red were injected into tumor-bearing rats, but no definite therapeutic effect could be determined.

GEORGE E. BEILBY.

RADIOLOGY

Johnson, G. C.: Modern Roentgen Therapy. Intensive and Deep, with Description of New Apparatus for Intensive Therapy. *Am. J. Roentgenol.*, 1916, III, 84.

Johnson advocates the uttermost boldness in dealing with recurrent malignancy. The sole question to be considered is, How much intensive radiation is required in each particular case to utterly destroy the recurrence present? The quantity having been determined, the radiation is applied with but little consideration for the fact that such a dosage may result in extensive dermatitis. In every case that the author recalls in which recurrence of malignancy has followed operation in spite of post-operative radiation, the recurrence has either been outside the limits of the radiation or the total amount of radiation applied has been too small; therefore he believes that the only safe and sane post-operative radiation is that which consists in a quantity per square centimeter as great as the skin will tolerate, and the area irradiated should be as extensive as possible.

Johnson has devised a heavily leaded box to be raised and lowered by a worm gear, so that the patient may be well protected while the area under treatment is only 3 inches from the anode. The Coolidge tube is cooled by an air blast; the patient is not frightened by the incandescent anode, and the short anode-skin distance greatly shortens the time of treatment.

In skin lesions Johnson employs from one to three sittings of from 40 to 70 X, depending upon the severity of the lesion. No filters are used and the penetration is only sufficient to send rays well beneath the lesion. On the eyelid he does not use to exceed 30 X at a single sitting.

The conclusions are:

1. Intensive radiotherapy intelligently employed is capable of producing quick destruction of superficial malignancies without pain in from one to three sittings, even in such delicate locations as the eyelid, with cosmetic results that are not obtainable by any other method.

2. Prophylactic radiation, post-operative, should be carried out conscientiously over a wide area beyond the apparent limits of the disease and sufficient radiation employed to insure the complete sterilization of the tissues.

3. Deep roentgen therapy is capable of producing quickly, painlessly, and safely, artificial menopause in hemorrhage and various gynecological conditions.

4. The prognosis of malignancy is not necessarily measured by the given extent, location, or character of the disease. The most brilliant results sometimes follow treatment of the most apparently hopeless cases.

The advent of the Coolidge tube has increased the possibilities of roentgen therapy to a remarkable degree. It has increased the necessity for skill upon the part of those employing it to a corresponding degree.

It is not necessary to measure every dose administered by means of a pastille if the operator is sufficiently skilled to be capable of exactly duplicating his dosage, but even then it is wise to frequently check the other methods of estimation employed by means of the pastille.

DAVID R. BOWEN.

Boggs, R. H.: The Local Application of Radium Supplemented by Roentgen Therapy. *Am. J. Roentgenol.*, 1916, III, 92.

Boggs says that experience of the past two years has shown that radium treatment cannot be successfully done at a greater distance than two, or a maximum of three, centimeters. It has been universally accepted that cancerous growths can be promptly, and also apparently permanently, cured at this depth from the radium tube. If, however, the disease is advanced and there is infiltration of the growth into adjacent lymphatics, the cure is only apparent.

An attempt has been made by using larger quantities of radium and increasing the time of exposure, to influence cancerous cells at a greater depth, but the universal reports show that not much has been accomplished in this direction. The overlapping tumors were damaged beyond recovery, regardless of the kind of filters employed. The rays of the radium in contact with the growth were too intense where they entered and too weak at a greater distance from the tubes than two to three centimeters. To place the radium at a distance from the surface in order that the rays will be nearly uniform at the point of entrance and at the distance required renders the radiation too weak even if several grams were employed. The same is not true of the present X-ray tube which, when powerfully excited, gives off many thousand times more rays than any

quantity of radium anyone has ever used. It has been estimated that 92 grams of radium would be necessary to place the radium at the same distance in order to obtain at a depth of 10 centimeters the same intensity of radiation as with the X-ray tube.

Boggs has, during nineteen months, treated 14 cases of uterine carcinoma with radium and roentgen ray, using from 2,000 to 3,000 milligram hours of radium with roentgenization after the Koenig-Gauss method for uterine fibroid. The sittings were repeated in four weeks; 10 cases were recurrent and the other 4 were so far advanced that they were beyond the operable stage. All improved except 2, in that the disease was checked, the growth diminished in size, the pain relieved, and the offensive odor lessened or entirely checked. Three have been clinically cured, and one, which is still apparently cured, was reported a year ago. In 2 other cases the disease has nearly all disappeared.

The treatment of carcinoma of the bladder, rectum, throat, and mouth have been less satisfactory. For instance, so far, Boggs has not treated a favorable case (epithelioma of the tongue), and can speak only of the cases which were hopelessly inoperable.

Boggs concludes as follows: It is necessary for the operator to know the relative value of radium and the roentgen rays when combining these two agents. In carcinoma of the uterus, for instance, nothing could be expected from a local application of radium with less than from 2,500 to 5,000 milligram-hours, using nothing less than 50 milligrams of radium element. Then after a rest of three to five weeks another course of treatment is usually necessary. When roentgen therapy is added it should be given in the same manner and quantity as that for the treatment of fibroids. How often both forms of radiation are to be repeated must be determined by the judgment of the radiotherapist who must be a clinician, because he cannot be entirely guided by the surgeon who is not familiar with any form of radiation. To secure permanent cures the effect of the radiation must extend from the primary growth out to the metastasis and the deleterious effect on normal tissues avoided. DAVID R. BOWEN.

Nagelschmidt, F.: A Radiologic Method by Means of Thorium X (Eine Bestrahlungsmethode mittels Thorium X). *Deutsche med. Wochenschr.*, 1916, xlii, 191.

The author describes the technique of the method of preparing and using thorium X (solution of Doramad in propyl-alcohol) in the treatment of skin diseases. The preparation is painted over the area of skin affected. Chronic eczema, psoriasis, warts, naevi, lupus, and malignant tumors are amenable to this treatment, and in such conditions good results are obtained. For the practitioner this method displaces the expensive X-ray apparatus, and radium which is even more difficult to obtain, in a large number of therapeutic procedures.

Moreover it has advantages over the more costly methods, inasmuch as it gives a more exact localiza-

tion and strength of dose, and there is exact control by the eye of any reaction on the skin. One or two cc.m. will cover a large area of skin and take the place of many roentgen sittings.

The indications are the same as for the use of the X-rays. For treatment of *navus vasculosus* the method seems superior to any other.

W. A. BRENNAN.

MILITARY SURGERY

Black, J. E., Glenny, E. T., and McNee, J. W.: Observations on 685 Cases of Poisoning by Noxious Gases Used by the Enemy. *Canad. Pract. & Rev.*, 1916, xli, 15.

The typical case was cold on admission, with a subnormal temperature. The patient was conscious but restless, the pulse slow and full (except in the collapsed cases). The face was cyanosed, intensely so in many cases, and the expression was strained and anxious. The posture varied. In some cases the patient sat propped up, with head thrown back, gasping for breath; others lay on the side with the head over the edge of the stretcher in an attempt to aid expectoration. The respirations were jerky and hurried, often numbering forty a minute, and were associated with a choking cough, accompanied by a varying amount of frothy expectoration. With each inspiration the chest was expanded to its fullest, all the auxiliary muscles being brought into play just as in an asthmatical paroxysm. The percussion note over the chest was somewhat impaired without being actually dull. Auscultation revealed the presence of moist sounds of different qualities all over the chest.

It was noticed that the patients who lived tended to pass through three more or less definite stages while under observation: (1) the asphyxial stage, (2) the quiescent or intermediate stage, and (3) the bronchitic stage.

Nearly all the cases on admission were in the first or asphyxial stage. This condition demanded immediate and energetic treatment. Grave symptoms appeared with startling suddenness, but if patients could be safely brought through this stage, recovery was the rule. The first stage gradually passed off after some 36 hours and the patient fell into a sleep from which he woke feeling much better. He continued in this state for, perhaps, a half day.

After these few hours of comparative quiet, symptoms of bronchitis began to manifest themselves. In the majority of cases these were not severe. In the cases, however, which had been kept alive with difficulty, there was a very short quiescent stage, followed by intense bronchitis. Four of the most severe cases died in this bronchitic stage. Their symptoms, as compared with the first stage, were as follows: The frothing secretion gave way to thick greenish mucopurulent expectoration; consciousness was replaced by delirium; the temperature rose from subnormal up to 104° F.; and the pulse became of small volume while its rate increased to perhaps 160.

Respirations were less choking, but more shallow, and numbered up to 70 per minute before death.

The aim of the treatment was:

1. To expel the excessive secretion from the lungs by emetics and stimulating expectorants.

2. To diminish the secretion.

3. To support the failing heart and reoxygenate the blood.

The routine treatment evolved from the experience gained was:

1. Abundant supply of air and warmth.

2. An emetic of salt and water if the patient was very cyanosed and had not already vomited, followed by the administration of ammonium carbonate gr. 15 and vinum ipecacuanhae 15 minims every three hours.

3. Oxygen inhalation in cases of marked cyanosis and dyspnea.

4. Opium 3 to 15 minims in restless cases to allay the mental strain.

5. Pituitary extract (1 ccm.) and brandy when the heart threatened to fail.

Post-mortem examinations (ten in all) have been made in cases dying at periods varying from less than a day to five days after inhalation of the gas. Only relative differences were found, even in cases dying at different periods after the gas attacks, so that a general description is sufficient.

The most important changes were found in the lungs, but some changes of note were present in the heart and stomach. These were edema, frothy secretion, enlargement, and subpleural hemorrhage.

None of the cases remained in the casualty clearing station for more than five days after the inhalation of the gas. Therefore the acute stages only are described in this paper.

On admission the cases were of two chief classes: (1) the acute asphyxial and (2) the subacute.

Of the first class almost one-quarter died. This class was characterized by orthopnea and marked cyanosis. The subacute cases, on the other hand, showed dyspnea never amounting to orthopnea and were cyanosed to a lesser degree.

EDWARD L. CORNELL.

Bergonié, J.: Rules for the Installation and Surgical Use of the Electrovibrator (*Précipites à suivre pour l'installation et l'emploi chirurgical de l'électro-vibreur*). *Arch. d'électr. méd.*, 1916, p. 21.

Bergonié describes the construction, method of fixation, and working of his electrovibrator, in an operating room, for the localization of magnetic foreign substances in the body. The instrument is used in connection with palpation in the first instance. When the number of vibrations reaches a maximum the best point for incision is reached. After incision is made the vibrations become clearer as depth is increased toward the exposure of the foreign body. Cessation of vibration is the index that all foreign magnetic bodies have been removed.

A number of reports are published from surgeons

at the front testifying to their appreciation of this instrument in the localization and extraction of projectiles.

A. Goss.

Laurence, L.: Present Ideas on the Treatment of War Wounds, Wounds of the Skull (*Les idées actuelles sur le traitement des blessures de guerre, les plaies du crâne*). *Rev. gén. de méd. et de chir.*, 1916, xxx, 65.

Most of the points connected with the treatment of gunshot wounds of the head discussed by Laurence are along the lines generally adopted by recent writers. Regarding the prognosis of such lesions he quotes the statistics of Lapointe which give a global mortality of 15 per cent. for wounds not involving the dura mater. In this figure are included cerebrospinal contusions, as well as some meningeal infections.

Cranio-encephalic wounds show a mortality of 56 per cent. This is reduced to 45 per cent in the case of 33 wounds where a tangential contact only produced a furrow. These figures refer to immediate prognosis only. The end-results are much more unfavorable; even when the proximate operative results are quite satisfactory the wounded remain for a long time exposed to grave peril. Some months ago Fresson reported that of 22 craniectomies with opening of the dura mater, 2 alone remained alive at the end of four and one-half months. One was hemiplegic and the other had serious functional trouble. Without doubt a large number of these late deaths were due to the presence of an intracerebral foreign body, and this is why the question of their early extraction becomes so important.

A. Goss.

Miles, A.: Some Observations on the Use of Hypochlorous Acid (Eusol) in Gunshot Wounds. *Edinb. M. J.*, 1916, xvi, 100.

This series embraces 16 cases of gunshot wounds which were received in the Edinburgh Royal Infirmary from the front. The cases all came at one time and the wounds were of varying severity. All were greatly infected, some very gravely.

The solution of hypochlorous acid was made as follows: Chloride of lime and boric acid, of each 12.5 grams, were dissolved in 100 ccm. of water and the solution filtered.

Open wounds were bathed once or twice daily with this solution and dressings moistened with the same were continuously applied, a sheet of mackintosh being placed over the dressings to prevent the escape of the volatile hypochlorous acid.

Funnelled or burrowed wounds were irrigated twice daily with the solution and moist dressings applied as before. In deep wounds an ingenious drip method was used to keep the wound constantly bathed with the solution.

The results were very encouraging, in most of the cases the sepsis being overcome in forty-eight hours. In four to five days the wounds were clean and covered with granulations. The granulations

were healthy and cicatrization rapidly took place. Three cases which did not progress so favorably cleaned up quickly with ordinary boric acid or ichthyol and glycerine dressings. However, there was probably difficulty in keeping the solution applied deep enough in the wound to allow the volatile acid to reach all the recesses. J. H. SKILES.

Picqué, R.: General Rules for the Immediate Treatment of War Injuries in an Ambulance at the Front (*Principes généraux du traitement immédiat des plaies de guerre dans une ambulance de l'avant*). *Bull et mém. Soc. de chir. de Par.*, 1916, xli, 460.

Picqué's extensive article giving details of the arrangements and methods adopted for the early surgical treatment of the wounded at the firing line, should be of interest to those engaged in the organization of the surgical service of an army in the field.

The two general principles which govern immediate surgical intervention are: (1) Every wound must be considered as more severe than it at first appears to be. (2) Every wound due to an artillery projectile must be treated as an infected wound.

In summing up the general results of the treatment of wounded at the present time he contrasts the somber picture presented in the history of ambulances in former days encumbered with wounded suffering from meningitis, peritonitis, gangrene, tetanus, osteomyelitis, etc., crudely operated upon and dressed without anaesthesia with the calm courageous wounded of 1914 to 1916 preserved from these fearful complications by all the artifices of modern surgery and progressing each day quietly toward recovery. W. A. BRENNAN.

Colston, J. A. C.: Personal Experiences at the Red Cross Hospitals at Pau, France. *Maryland M. J.*, 1916, lxx, 14.

In the Red Cross work at Pau, France, the best results in nerve surgery were obtained by early operation. The great number of these cases led to having them cared for at a Central Hospital, especially equipped for electrical treatment.

In like manner the large number of joint injuries made necessary a hospital devoted solely to mechanotherapy. Many of the masseurs were soldiers who had lost their sight during the war. Conservative treatment in many joint injuries gave excellent results, but the badly smashed joints were among the most serious cases.

Tetanus was comparatively common during the earlier periods of the war, but now is relatively rare owing to routine administration of antitetanic serum to those wounded at the first-aid station.

With few exceptions all wounds were infected. The best results in treating these wounds were secured by continuous irrigation with salt solution and changing the dressings frequently. Where the wounds were very foul, a dilute solution of potassium permanganate was used. Ample drainage must be provided and as little packing as possible used.

The most virulent gas bacillus infections occur within a few hours after the injury and are seen only in the hospital directly behind the firing line. Colston observed some infected cases associated with gas production which yielded readily to free incisions and irrigation with hydrogen peroxide. Anurisms were more infrequent than would be expected.

Recent abdominal wounds were not transported any further than possible and consequently were rarely seen at Pau. In brain injuries infection was constant and the mortality high.

Of all cases treated at the Red Cross Hospital to which the author was attached, the mortality is estimated to have been from 2 to 4 per cent, but it must be remembered that the mortality in hospitals near the firing line is much higher. The percentage of soldiers able to return to the front is estimated at between 60 and 70. D. L. DESPARD.

Spelman, J. D.: With the American Red Cross in Belgium. *Lancet-Chin.*, 1916, cxv, 51.

Prophylactic efforts have been very successful in the prevention of typhoid fever, venereal diseases, and tetanus. As a rule the soldiers are well fed, the meat supply being especially good.

The care of the wounded is becoming more and more efficient. The wounded are transported as rapidly as possible to a field hospital. The emergency dressing consists of the application of tincture of iodine and sterile gauze, and the injection of antitetanic serum. The transfer to a base hospital depends upon the patient's condition.

The severity of the wounds depends largely upon the kind of missile and the range at which it was fired. Rifle wounds usually cause comparatively small wounds, although if the bullet has become deformed by previously striking something else, or if it ricochets the wound may be very extensive. Pieces of shrapnel cause great mutilation. The shrapnel themselves do not cause such extensive wounds.

Gas gangrene has become a serious problem. The anaerobic bacilli, so common in the highly fertilized fields in Europe, are carried deep into the tissues. Gas gangrene is so prevalent that every case is considered potentially one of gas gangrene. At the earliest symptom free incisions are made into the involved area. Local applications of sodium hypochlorite have proved beneficial.

The predominance of infection is still appalling. A variety of methods of treatment have been tried, from the radical carbolic acid treatment of Lister to the hypertonic salt solution of Wright, but none has proved a panacea. J. H. SKILES.

Spelman, J. D.: Medico-Military Notes from the Belgian War Zone. *M.B. Surgeon*, 1916, xxxviii, 7.

Spelman gives an interesting, straightforward account of the medico-military condition in the Belgian section. On account of the highly fertilized soil of Belgium, gas-gangrene was very common at the time of his report (date of service not given).

So prevalent was this trouble that every case was potentially one of gas-gangrene and the treatment on reception was governed by this fact. Bitter experience had demonstrated the futility of conservative treatment, and *débridement* was the rule. The technique is as follows: The entire skin area, in the case of a limb, for instance, beyond the articulations to each side of the wound, was carefully shaved and the skin disinfected with green soap, alcohol, and tincture of iodine. The overhanging skin edge of the wound was next completely excised, and all the soft parts whose vitality was liable to have been lowered were removed, so that the resulting wound was funnel-shaped, with its smallest diameter internal and the sides of smooth, healthy tissue, free from all projecting pedicles. Hydrogen peroxide, 1.8, was used for lavage twice daily for the first several days, and thereafter once daily. If the wound was narrow and deep, the course of the projectile was located by means of a blunt probe and a channel cleaned out, so that through-and-through drainage could be instituted. The pieces of clothing before referred to would usually be found somewhere along the course of this channel. Penetrated rubber tubing was the drainage used. Whenever an exit wound was not found and the projectile could not be easily located, an immediate X-ray was taken, as it was considered an unpardonable sin to leave any foreign body. This line of treatment gave birth to some terribly large gaping wounds, but it effectually removed most of the infecting material afforded perfect drainage and minimized the development of gas-gangrene; and when the wound was entirely clean, a plastic operation reduced the healing process to about two weeks.

When gas-gangrene developed in spite of this treatment, a virulent germ was usually found growing in an unfavorable place. If caught early enough, the part was incised, when the gas would discharge with a characteristic pop, the subcutaneous fat would be found to be darkened and watery, and the muscle black and friable. Radical cutting away of necrotic tissue with dressings every two hours and hydrogen peroxide lavage and the deep injection of oxygen and general stimulation gave results in the milder cases; but immediate amputation, well above the highest limits of the process, was necessary in the severe type.

Much has been said of the efficacy of Dakin's fluid in gas-gangrene. This fluid is a solution of sodium hypochlorite and sodium carbonate of delicate strength, which has been filtered through boric acid, so that it is acid to phenolphthalein. It is a powerful germicide, capable of killing staphylococci in two hours. Solutions of chlorinated potassium and sodium are not new as disinfecting agents, but are destructive to living tissue because of their alkalinity. The new solution has not this disadvantage, even in the fairly concentrated form in which it is used, and besides it seems to possess the wonderful property of dissolving necrotic tissue

and practically sterilizing a wound in about twelve hours. It is used either by the drip method or as a frequently changed wet dressing. Its field of usefulness is apparently very great, but familiarity with the rapidity and virulence of the sort of perfringens infections which have but a two-day incubation period would lead one to think that this therapeutic measure would not enjoy so much success as it has with the milder infections that have developed only after five to seven days in spite of the fact that *débridement* had not been performed and favorable anaerobic conditions had therefore existed.

The *coupe-de-hashe* method of amputation is now universally used. It consists of a straight amputation without effort to make a flap. The skin and muscle are cut through above the wound and down to the bone, a pie-plate retractor is used on the soft parts, and the bone sawed through. The arteries are tied off, and the nerves put on the stretch and cut off short. This method is amply justified by the universal presence of infection, the conservation of tissue, and the minimizing of shock. When all danger of infection has passed, a secondary amputation is performed and a flap made. Very good results have been obtained in reducing the necessity for secondary flap operations by applying traction by means of adhesive plaster strips, and weight attached to the skin about the stump, which gradually draws the muscle and skin over the bone during the process of healing.

The following statistics are from the last 2,000 or more cases to June 30, 1915, at the hospital in La Panne:

Wounds from rifle ball	497
Wounds from shrapnel ball	94
Wounds from fragment of shell or shrapnel	1,074
Accidents	285
Fractures	129
Contusions	108
Causes undetermined	45
Total	2,233

The mortality of these cases was 233, which was approximately 10 per cent. Of the remainder, another 15 per cent were probably invalided from the military service after leaving the hospital, while more than 75 per cent returned to the firing line. This hospital received only the surgical cases of a more or less severe nature, and these statistics therefore give ample testimony to the ability of its director, Dr. Anton Depage. W. M. BOORMAN.

LaGarde, L. A.: Relation of the Physician to National Preparedness. *Read Before Dauphin Co. Med. Soc., Harrisburg, Pa., 1916, Mar. 7.*

The relation of the physician to national preparedness or how the physician in civil life can be prepared and become efficient to serve the state as an army medical officer in time of war is one of the live issues with the medical profession of the entire world today. It goes without saying that successful

campaigning in which large bodies of troops are called together to abide in any climate and in all seasons depends upon an efficient medical department. The advances in preventive medicine in and out of tropical countries and the army medical officer's ability to control the sick-rate of armies make his presence indispensable to the success of all military operations. His value as a safeguard against disease in armies is all the more appreciated as we study the failure of campaigns in the past and the handicap that non-effectives prove to be to the movements of expeditionary forces.

Those who are interested in the sick-rate of armies in the pre-sanitary era will find interesting reading in the writings of Sir John Pringle on the campaigns in Flanders from 1747 to 1758. It was common then for an army to lose from 25 to 50 per cent of its effectiveness by disease alone.

Writers have often cited the Walcheren expedition against Antwerp in 1809 as a classical example of the failure of a campaign, and the utter ruin of an army by disease. The Earl of Chatham landed 42,000 well drilled and seasoned troops on the Island of Walcheren in Zealand. The region was low and swampy, the water bad, and the very air pestilential. August 25, three weeks after landing, 5,000 sick were in the hospital. The sick-rate increased so rapidly that it became necessary to withdraw the army to England with the exception of 17,000 men. On September 10, 7,000 out of the 27,000 that had been left behind were on the sick list and the death-rate up to that date was 52 per thousand; in October it rose to 62 per thousand, or an annual death rate of 744 per thousand. After taking account of the deaths and those invalided home, the force of 17,000 men had dwindled down to 6,749 men, November 25. The troops were all withdrawn in December. In reckoning their losses, British writers figure that the loss in deaths from disease for the whole of the expeditionary force of 42,000 was 8,400 while the deaths from battle casualties were but 206.

The San Domingo expedition in 1802 is often cited by writers on the dangers attending campaigning in tropical countries. Napoleon Bonaparte sent General Leclerc to the island with 20,000 men. Of this number 5,000 died of yellow fever, malaria, and dysentery in a short space of time and 5,000 more were in the hospital. Reinforcements of 20,000 arrived, but death was more rapid than the ships could carry reinforcements from France. Later, but 10,000 of the men were left, and these soon succumbed to a small British force sent against them. Of 30,000 excellent troops but few ever returned to France.

In order to appreciate the value of modern methods of sanitation in tropical countries when administered by army surgeons, the author compares the first American occupation of Cuba with the French occupation of San Domingo 99 years later, and also with the American occupation of Panama 102 years later. In 1901 General Gorgas, U. S. A., as

Chief Surgeon of Havana, while operating with a sanitary force from the army, drove yellow fever from that city in the short space of three months, the first time that it was rid of the scourge in 150 years, and he therefore brought the death-rate from this cause down to nil.

As Chief Sanitary Officer of the Panama Canal Zone, while operating with a sanitary force made up of medical officers from the Army, Navy, and Public Health Service, General Gorgas established modern sanitation under federal control at the Atlantic and Pacific ports of Colon and Panama, and by a general sanitation of the Canal Zone he was able to reduce the death-rate of the canal force of 45,000 men, from 240 per thousand in the days of the French occupation in 1881 to 1889, to 8 per thousand in 1913. He and the federal officers working with him demonstrated for all time that tropical countries are habitable for white men. General Gorgas is right when he says that the commercial and physical success of the Panama Canal is insignificant when compared to the sanitary achievements which make it possible for the white man to live and work in the tropics, and at the same time maintain his health at as high a point as he can while working in the temperate zone.

Another striking example of the value of modern sanitation under federal control was seen in the recent occupation of Vera Cruz, Mexico, by our troops.

Going back to 1846, during the Mexican War, 100,454 men were sent to Mexico, serving on an average of thirteen months. The deaths incurred in battle numbered 1,540, while the deaths from disease amounted to 10,086; and 12,252 were discharged for disability, mostly on account of disease. The sick-rate was from 17 to 27 per cent. In December, 1847, General Scott wrote, "The force at Chapultepec fit for duty is 6,000 rank and file, the number of sick exclusive of officers is 2,041." The mortality from disease in this war was 110 per thousand, and the battle loss 15 per thousand. Seven times as many died of disease as from war wounds.

The author compares this data with that of the expeditionary force under General Funston in the recent occupation of Vera Cruz in 1914, from April to November. This force consisted of 2,400 men. At no time was the sick-rate higher than it would have been in the United States. The army landed in a tropical city that was notoriously ill-kept; smallpox was prevailing epidemically; typhoid fever was prevalent; and the community was just recovering from an epidemic of cerebrospinal meningitis. Not a single case of any of these diseases occurred in the command during the American occupation.

There were 6 cases of measles and 3 of diphtheria among the troops. The principal cause of morbidity was malaria and dysentery, but these were held at minimum. There were 76 cases of dysentery with one death. The venereal scourge was very prevalent in the city population. The houses of

ill-fame and clandestines were brought under military rule and the non-effective rate from venereal disease was held at 5 per thousand. The death-rate for seven months of occupation was as follows:

For disease 1.0 per thousand.

For injuries 5.0 per thousand.

No yellow fever was noted, this disease having been eradicated by American methods in force since 1906.

Attention is called to the misfortunes that formerly overtook expeditionary forces in the pre-sanitary era, using Walcheren and San Domingo as typical examples, and to the experience of the United States Army in Mexico under the old and new methods of conserving the health of armies. As striking examples of what can be accomplished by proper organization of a medical personnel, the author cites the results of the occupation of Cuba in 1898 and the sanitary arrangements of the Canal Zone during the work on the Isthmian Canal. Magnificent results have been accomplished in Cuba, Panama, and Mexico because our organization was complete, manned by experts, and under absolute government control. The same can be promised for the future, both at home and abroad, with an army of small or larger proportion, if it is provided with enough experts to safeguard the health of the troops, and here is the crux of the argument. Experience in mobilizing armies has demonstrated over and over that it requires from 7 to 10 medical officers per thousand of enlisted troops to keep the soldiers well and fit for field service.

The work of the medical department in war resolves itself into three parts:

1. Care of sick and wounded.
2. Sanitation and hygiene.
3. Administration.

In order to present the subject in a concrete way, LaGarde presumes that this nation is meeting a crisis and is calling for one million men. That number of soldiers, in accordance with the proportions given, will require 10,000 medical officers. This great number of medical men to administer to the wants of an army is no stretch of the imagination. In the Civil War, for the 2,000,000 men under arms on the Union side, alone, 12,000 medical men were commissioned to look after them. England has 10,000 medical officers with her expeditionary force at the front today, while France is said to have 15,000. Today, in the regular army, there are commissioned but 143 medical officers who have received special training in conserving the health of the troops. "Roughly speaking the 1,000,000 soldiers will have to have 9,500 more medical officers, and where are they to come from? We can soon get 9,500 physicians from civil life no doubt. Of this number 3,000 will be required to look after the sick and wounded and the remaining 6,500 will be required to look after sanitation and hygiene and the administrative functions of an army medical department. How much does the busy doctor in civil life know about the latter? The civilian med-

ical man is ready himself to answer that he is untrained and unequal to the task."

It takes nine months of intensive study in the Army Medical School at Washington to teach the recent graduate of medicine the specialty of the medico-military officer. The curriculum includes:

1. Military surgery.
2. Medical department administration.
3. Ophthalmology.
4. Military and tropical medicine.
5. Military hygiene.
6. Sanitary chemistry.
7. Bacteriology, pathology, laboratory diagnosis.
8. Sanitary tactics.
9. Operative surgery.
10. Roentgenology.
11. Psychiatry.

The young medical officer upon receiving his commission is sent into the field with troops, and made to put the theoretical part of his teaching into practice, and after the lapse of one year he is looked upon as a full-fledged medico-military officer, worthy of the name.

While it is true that the 6,500 medical men from civil life cannot be given the intensive instruction to make them fit medical officers, much can be done to make them of extreme value to the state, and as war goes on, they can then very soon be converted into medicomilitary experts.

There are three avenues in time of peace open to the physician:

1. Service with the National Guard.
2. Service with the Medical Reserve Corps, United States Army.
3. Service with the Red Cross.

1. The National Guard is one of the sources from which we obtain very valuable officers in time of war; it consists of about 500 members who are partially trained as medicomilitary officers. Commissions in the Guard are obtained from the governors of the states.

2. In 1908 the Medical Reserve Corps, United States Army, was established by law. The recipients of commissions in this corps hold the rank of First Lieutenant on the inactive list. There are now 1,600 commissioned officers of recognized standing and ability. These members are physicians in civil life who are organized in groups in the larger cities for the purpose of instruction. More than 500 of them are taking the correspondence course from the Medical Officers School at Fort Leavenworth, Kansas; official literature is sent them; many have the benefit of membership in the Association of Military Surgeons, and plans are under way in the Surgeon-General's office to improve the opportunities for obtaining a medicomilitary education.

Medical camps of instruction have been ordered for 1916 at Tobyhanna, Pa.; Anniston, Ala.; Sparta, Wis.; Fort Riley, Kan.; Monterey, Cal. In these camps officers of the Medical Reserve Corps are taught, with National Guard officers,

valuable lessons in active campaigning with troops. This is a course that is particularly adapted to the younger physician.

In these camps there is also taught: (1) physical exercise; (2) the school of the soldier, ceremonies, and the manual of the saber; (3) litter drill; (4) tent drill; (5) lessons in administration of a regimental hospital, field hospital, and ambulance company; (6) stable management; (7) the important subject of recruiting armies; (8) the manner of rendering papers, records, and returns; (9) camp sanitation.

The correspondence course at Fort Leavenworth includes instructions in (1) how to obtain medical supplies; (2) the direction and execution of all matters of public health among people of occupied territory; (3) the method of disposing of the sick and wounded so as to insure the return of effectives to the front, and how to relieve the fighting force of non-effectives; (4) transportation of the sick and wounded; (5) establishment of aid stations, dressing stations, and hospitals, hospital trains and hospital ships on the line of communication; (6) how to keep the records of the sick and injured for reference, touching upon the claims of individuals and the best interests of the government; (7) how to instruct troops in personal hygiene; (8) procedures on Examining Boards, Retiring Boards, Court Martials, etc.

3. The American Red Cross, as at present organized, is a very helpful auxiliary of the Medical Department in time of war. In its recent organization there is a Director of Civilian Relief, and a Director of Military Relief who is charged with the supervision of all Red Cross work in war.

The Director of Military Relief is now organizing hospital units in well-populated centers. A hospital unit consists of a military hospital equipped with a personnel, supplies, and tentage for 500 beds ready to take the field on short notice. Units of this kind are now under way in Boston, Philadelphia, Rochester, New York, and Cleveland.

The personnel consists of 20 doctors representing the different specialties that are usually grouped on the staff of a modern hospital, two dentists, 40 nurses, and 157 subordinate attendants. The personnel is enrolled in the Red Cross and the names are registered in the office of the Surgeon General. The supplies are bought and stored ready for use. The unit is inspected from time to time by a regular medical officer, and in time of war it is turned over to the War Department and placed under the command of an officer of the Medical Corps.

The Director of Military Relief is also organizing hospital columns to consist of 5 medical officers and 65 trained hospital corps men who are drilled in the method of rendering first-aid at the front, and their function is to assist the transport columns.

The medical officers of the hospital units and columns are members of the Medical Reserve Corps and in time of war they are placed on the active list and graded with higher rank in the volunteer service. The nurses and subordinates are placed on the rolls of the Quartermaster's Department.

In the Spanish American War there were 6 civilian surgeons for every regular surgeon; in the Civil War there were 66 civilian surgeons in the Union Army for every regular surgeon. Young medical men should seek to enter the Medical Reserve Corps and avail themselves of its advantages, and the older ones who are physically sound should attach themselves to the hospital units of the Red Cross.

Proper organization among the physicians in civil life acting in concert with the regular Medical Corps will accomplish a great deal in mitigating the horrors of war. Organizations such as are now being formulated will do much to prevent the breakdown of the Medical Department such as was witnessed in the Spanish-American War. If we can make use of the modern methods of medical science to good advantage in active campaign we will serve humanity and the state efficiently.

HOSPITAL, MEDICOLEGAL, AND MEDICAL EDUCATION

Wrong Diagnosis. *Med. Rev.*, 1916, LXXXI, 372.

A suit was instituted against a physician for alleged malpractice growing out of the following facts which are taken from the review of the case in the Supreme Court of Washington. The defendant made an examination of the plaintiff and diagnosed her trouble as cystic tumor. Prior to this an examination had been made by another physician who determined that she was pregnant. Subsequent to the defendant's examination another examination was made by the first physician and another who again determined that the plaintiff was pregnant. The defendant when informed of their decision said "they must be crazy" or words to that effect. The plaintiff did not believe she was pregnant at the time, stating that the first suspicion of this condition occurred three weeks after the operation by the defendant when she felt the quick movement of a fetus. Prior to the operation she had menstruated and doubtless so told the defendant, as well as the other examining physicians.

The court says: "The expert testimony of both parties at the trial showed that the bimanual test may give indicative results after the third month; that the same sensation may possibly result to the palpation of the physician's hands from tumors, the same symmetrical development of the uterus may appear from the existence of a tumor; the mother feels quickening before an examiner can feel ballottement or rebound; there is often ballottement on one examination during the fourth, fifth, and sixth month, and none at other examinations about the same time. So that it is manifest that there might be utterly different, though thoroughly honest, opinions reached by physicians as to the patient's condition at or about the time of the examinations by these various doctors. . . . But did appellant (the defendant) exercise the proper care and diligence in advising, immediately upon his diagnosis, an operation for tu-

more? There is no complaint made of the operation itself, as to the manner of its being performed. The matter of the ethics and propriety of the appellant's conduct in proceeding with the operation without notifying the patient's former attending physician is immaterial. But the matter of appellant's notice that other competent and reputable physicians had positively declared that the woman was pregnant is serious. Surely it put upon the appellant a greater degree of diligence and care to be as certain as circumstances and conditions surrounding the case would admit of. Notwithstanding what she may have stated to the examining physicians, pregnancy is not an improbable condition to the ordinary married woman at the age of 37 years. The appellant urges, however, that the incision made was in the nature of an exploratory operation, to determine the true condition of the patient. As to this, though no point is made of it, he had not the consent of the patient and her husband to make an exploratory operation. The consent was upon a positive assurance that tumors existed and that an immediate operation was necessary to remove tumors. The court then states that the fact that the defendant, knowing as he did the opinion of the other examining physicians, instead of waiting for a time to watch developments, went ahead and operated was a question of fact for the jury to determine and not one of law.

J. A. CASTAGNINO.

Liability for Death of Hospital Patient Claiming to Have Drunk Mercuric Chloride Solution.
J. Am. M. Ass., 1915, lxxv, 680.

The plaintiff, the mother of the deceased, obtained a judgment in the trial court against the hospital for the death of her 18-year-old son, alleged to have been caused by the negligence of one of the hospital employees.

The facts, briefly, are as follows: The deceased was a patient in the hospital suffering from an attack of pneumonia. For about one week he had a special nurse who used a solution of mercuric chloride for disinfecting the thermometer. She kept this solution in a glass which was left on the chiffonier in the patient's room about seven feet from the bed. When her services were no longer deemed necessary on account of the condition of the

patient, she withdrew from the case leaving this solution of mercuric chloride on the chiffonier. That night the patient being restless was observed about 2 a.m. getting back into bed. He told the attendants at that time that he had drunk "that green stuff."

The plaintiff's contention was that her son's death was caused by poisoning from drinking the mercuric chloride solution rather than from a recurrence of acute pneumonia due to relapse. In reviewing the case, the court said, "It may be conceded that, considered as an abstract question of law, it was negligence to have the mercuric chloride solution in the room where it could have been reached by the patient. The question, however, was: Did such negligence contribute to or cause his death?"

"Clearly, if he did not drink that solution, his death could not be attributed to such negligence, however gross it may have been. The condition of the patient after the alleged taking of the solution was not accompanied by symptoms shown, without contradiction, by reputable physicians and nurses to manifest themselves in cases of such poisoning. None of these, except the vomiting, manifested itself in this case, and that, as it clearly appeared, was due to the administering of whites of eggs as an antidote. Other symptoms exhibited, such as a high degree of temperature and greatly accelerated heart action, were conclusively shown to be inconsistent with the theory that the patient died as a result of taking a poisonous solution of mercuric chloride. The disappearance of the solution, assuming that it was of poisonous strength and quantity, was just as consistent with the theory that it was thrown out of the window as it was with the theory that the patient drank it; indeed, more so, since had he drunk it, the effect of so doing would have manifested itself in certain symptoms none of which was exhibited." The court reverses the judgment of the trial court.

It will be noted in the foregoing review that the reviewing court stated that the leaving of the poison in the room where the patient could reach it was conceded to be negligence, and intimates that had the patient's death been caused by, or attributed to, the drinking of this solution the finding would have been otherwise.

J. A. CASTAGNINO.

GYNECOLOGY

UTERUS

Sampson, J. A.: The Radical Operation for Cervical Cancer; Report of Forty Cases. *N. Y. St. J. Med.*, 1916, xvi, 62.

Sampson states that the indications for this operation are evident from the poor results of less extensive operations and also from the fact that cancer is found in tissue removed by this operation, which was not removed by the former operations. He gives his results in 40 cases operated upon during ten years by a modified Wertheim operation and a description of his technique in so far as it differs from the classical Wertheim operation.

He considers local treatment of the growth unnecessary in the majority of cases, if care is exercised in cutting across the vagina. Catheterization of the ureters is also unnecessary if the ureters are exposed at the beginning of the operation.

After the abdomen is opened, careful examination is made to determine the extent of the growth. Posterior and lateral extension of the disease which fixes the cervix and cannot be palpated around, hydro-ureter, and extensive metastasis are contraindications for operation.

The ureter is exposed above the parametrium but not detached from the flap of peritoneum. The ovarian vessels and round ligaments are ligated and the uterine vessels exposed and divided between ligatures at their origin. The cervix is then separated from the rectum as this frequently permits the entire uterus to be lifted up and facilitates the remaining steps of the operation. Next the bladder is freed from the cervix and in case it is adherent it is better to deliberately excise a portion than to risk tearing it by blunt dissection.

The parametrial portion of the ureter must be dissected free from its sheath to permit removal of the sheath and a wide excision of the parametrial tissues below.

Cutting across the vagina is done below a heavy right angle clamp, the vagina having first been cleansed from below. Removal of the pelvic lymph nodes from a pathologic standpoint should be the first step in the operation. Practically their removal is mainly of prognostic and rarely of curative value. It is the author's practice after the removal of the uterus, to explore the sides of the pelvis and remove the lymphatics if any enlarged or hard nodes are found and the patient's condition permits. The raw surfaces are covered with peritoneum and a vaginal drain of narrow gauze introduced, but not in contact with the ureters.

As to the primary mortality, 7 of the 40 patients died as a result of the operation—a mortality of 17.5 per cent. Five of these cases were so far ad-

vanced that operation should not have been attempted. So it is evident that with better judgment the primary mortality may be considerably reduced.

Among the post-operative complications, post-operative cystitis was rather frequent but required special treatment in only three or four cases. One vesicovaginal fistula developed two weeks after operation and was repaired later. Two ureterovaginal fistulae developed also at the end of the second week. One healed spontaneously and in the other the ureter was transplanted into the bladder.

As to the ultimate results, 15 patients were operated upon from five to ten years ago, with a primary mortality of 4. Of the 11 who recovered 7, or 63 + per cent, or 46 + per cent of the entire number, are living and apparently free from cancer.

The author says that the indications for this operation are evident. It has technically been sufficiently developed to render it reasonably safe in suitable cases and is already justified in the hands of those who have given it a thorough trial. It remains for a more general adoption, but this should be done only by those who have specially prepared themselves to perform it properly. S. A. CHALFANT.

Nesselrode, C. C.: Heat in the Treatment of Carcinoma of the Cervix. *Southwest J. Med. & Surg.*, 1916, xxiv, 31.

The author has used the Percy "cold iron" 17 times in 14 different cases of carcinoma of the cervix, with but two complications. Once he punctured the anterior wall of the uterus, which was readily closed by suture and no trouble arose from the accident. One case developed a vesicovaginal fistula one week after cautery. Of the 14 cases treated 13 were inoperable. Of these, 3 have since died. There has been no hemorrhage in the other 11 since the treatment. In most of the cases there has been complete disappearance of the original cervical mass.

These cases will probably all die of metastatic cancer, because in each instance there was involvement of lymphatics beyond the area to which the heat could infiltrate, but their lives have been prolonged and made very much more comfortable.

EDWARD L. CORNELL.

Percy, J. F.: The Value of Heat in the Treatment of Massive and Utterly Inoperable Uterine Carcinoma. *Penn. M. J.*, 1916, 311, 236.

Basing his opinion on experiences in a number of cases of inoperable uterine carcinoma, Percy advises the thorough application of low degree heat, which he finds superior to any other present method,

including X-ray, radium, and the knife. The low heat not only sterilizes the whole pelvis and destroys the inflammatory mass in cases of secondary infection, but also eradicates the gross mass of cancer.

Percy's technique is as follows: After opening the abdomen both internal iliac and ovarian arteries are tied; the vagina is dilated for the admission of the proper sized water-cooled speculum, and the heating iron is passed to the fundus of the uterus, it is exceedingly important because of the low temperature of this heating iron to hold it in the same position until all of the contiguous structures are so hot that the hand of the surgeon can hold the malignant mass no longer. The surgeon's hand if incased in a medium-weight rubber glove can tolerate a temperature of 120 to 130° F. (49° to 54° C.). The normal tissue cells resist a temperature of 135 to 140° F. The iron is held in position until all the malignant tissue that can be reached by it has been coagulated and it is then moved to a new area and the process repeated.

There are five important sites for cancer in the uterus: (1) cervix, (2) uterine body, (3) broad ligaments, (4) bladder, and (5) rectum. If the tumor is small passing the iron to the fundus of the uterus will suffice and reach it in any location. If the mass is large the end of the heating head should be withdrawn from the fundus of the uterus and the destructive process carried out in each cancerous mass—broad ligaments, base of bladder, or rectum.

In cases of recurrences of diffused metastasis in the pelvis, following a Wertheim or panhysterectomy where there is not a sufficient mass for the development of heat, the author fills the vagina with a beef mass and introduces the heating iron through the center of the beef. In this way the temperature is raised sufficiently to destroy the cancerous growths in the base of the bladder, the urethra, the stumps of the broad ligaments, and the vaginal walls.

The method used by Percy will, in his opinion, cure 50 per cent of cancers of the hopeless type. It is also of value as a preliminary procedure if used three or four months prior to operation, minimizing the risk of recurrence. Several successful cases are reported.

L. R. GOLDSMITH

Neel, J. G.: Retrodisplacements of the Uterus. *Surg., Gynec. & Obst.*, 1916, 221, 233.

Uncomplicated retrodisplacements rarely cause symptoms. Hence the effect upon the function of the surrounding structures is the important factor to be overcome in all operative procedures.

The supporting tissues of the uterus may be divided into intrapelvic and perineal structures. In order to correct retrodisplacements it is important that each division should be restored as nearly as possible to the normal.

The following operation has given excellent results in over one hundred cases: The abdomen is opened through a midline incision which is carried

down to the symphysis pubis. Both sheaths of the rectal muscles are opened and dissected free sufficiently to allow the placing of the suture of silk in the under surface of the fascia about 1 cm. from the median line just above the symphysis. The suture is then carried through the underlying muscles and peritoneum just lateral to the reflection of the bladder on the anterior abdominal wall. The peritoneum is next caught up at short intervals down to the internal inguinal ring and along the course of the round ligaments to a point about two centimeters from the uterine cornu where the ligaments are pierced and the suture brought out of the abdominal cavity and tied near the point of entrance.

Where there is a displacement of the cervix, a running suture of silk is taken in either uterosacral ligament, beginning at their junction with the cervix and carried back to the pelvic brim.

The conclusions are as follows:

1. There is no mutilation of pelvic structures.
2. No injured surfaces are left to favor adhesions.
3. The normal supports of the uterus are utilized in such a manner as not to interfere with their evolution and involution and therefore it offers no hindrance to future gestation.

Harper, F. A.: The Mechanical Aids to Uterine Displacements. *Med. Council*, 1916, 131, 13.

The author says that through pelvic mechanotherapy there is opened up one of the largest fields in medicine to-day; one which will place pelvic surgery where it rightly belongs as a part of the treatment of pelvic diseases. He sums up the non-surgical aids in uterine displacements as follows:

1. The proper application of pelvic massage or manipulation to overcome deformities and displacements is an essential aid.
2. The use of supportive and corrective aids, such as properly applied tampons and pessaries to assist in holding the parts in proper position, just as bandages and splints are applied after replacement of dislocated or fractured bones. This relieves stasis and improves circulation so that reconstructive changes may overcome the abnormalities.
3. Vibratory massage is useful.
4. Electricity has a place as an aid.
5. Special postural and deep-breathing exercises are helpful.
6. Prolonged and frequent vaginal douches as well as other hygienic measures will help reduce pelvic surgery to a minimum.

C. D. HARRIS

ADNEXAL AND PERIUTERINE CONDITIONS

Wilder, R. M.: Peritonitis Following Acute Ovaritis of Anginal Origin. *J. Am. Med. Ass.*, 1916, 151, 599.

The patient, aged 6 years, was seen by the author, August 10, on account of a sore throat. For two days she had felt feverish. The bowels were constipated and the appetite poor, but there was no

abdominal pain. Examination revealed a temperature of 103° F., a flushed dry skin, dry lips, and a heavily coated tongue. The pharynx was hyperæmic and the tonsils were large, edematous, hyperæmic, and studded with discrete millimeter white patches. August 20, the patient showed marked improvement, the throat was no longer sore, and the temperature was reduced to 99° F. August 22 she was found in a serious condition, with a temperature of 102° F., a rapid pulse, and rapid respiration. The abdomen was greatly distended, tympanitic, and tender. This tenderness was greatest in the lower quadrants, but was equal on the two sides. There was no vaginal discharge. The right shoulder joint was tender, but not swollen. The condition of the throat had improved. The urine contained no albumin or pus. A leucocyte count was 28,000, with polymorphonuclears comprising 90 per cent.

A diagnosis of peritonitis was made and, although the prospects were unfavorable, the patient was operated on. At operation the peritoneum was found hyperæmic and lusterless and in the pelvis was a small amount of thin pus. The appendix seemed normal. A drain was inserted, but the child died forty-eight hours later.

At the necropsy a general peritonitis was observed. The intestines showed no perforation, no volvulus, and no diverticula. The cæcum and appendix were slightly hyperæmic, but, with this exception, appeared normal. The mucosa of the stomach and bowel appeared normal. Microscopic examination of the ovary, tubes, and uterus revealed in the tubes and uterus an extreme degree of hyperæmia, but no hæmorrhages. In the lumen of the tubes there was no exudate. In the lumen of the uterus was a small collection of leucocytes, half of which were mononuclears. The ovaries showed, in addition to passive congestion, small hæmorrhages, and in the ovarian tissues a few diplococci with short chain streptococci were found. Cultures of the abdominal fluid obtained at operation resulted in the pure growth of gram-positive non-capsulated diplococci and short chain cocci belonging to the streptococcus group. The organism appeared on blood agar as a small, circular, moist colony, gray, and producing marked hæmolysis. Its growth was best under anaerobic conditions. Inoculation into rabbits gave negative results. EDWARD L. CORNELL.

EXTERNAL GENITALIA

Child, C. G.: The Repair of Complete Laceration of the Female Perineum. *N. Y. St. J. Med.*, 1916, xvi, 70.

In the primary repair the only procedure is to unite the recently severed tissues. In the secondary repair it is necessary to remove the cicatricial tissue and to recognize and reunite widely separated muscle-fibers.

The author states that the best method for the secondary repair is that devised by Ristine in 1899.

He gives the technique of this operation and reports his results in 20 cases.

The technique is as follows: An incision is made from one caruncle to the other, crossing the posterior vaginal wall about 1.5 inches from the anus. From each end of this incision another is made to the ends of the retracted sphincter ani. The flap of vaginal mucosa thus outlined is dissected free from above downward. In this way the anterior rectal wall is lengthened by the flap of vaginal mucosa and the wound protected. The edges of the vaginal mucosa are united by No. 4 40-day catgut and the muscles by figure-of-eight silkworm gut, the lower one of which unites the sphincter ani muscle.

Child reports 10 cases operated upon in this way with primary union in 9 and complete restoration of function in 9. In the tenth case, after three months, the patient could not control perfectly a very loose stool.

S. A. CHALFANT.

Spalding, A. B.: Immediate Perineorrhaphy. *Surg., Gynec. & Obst.*, 1916, xvi, 231.

The author states his belief that practically every confinement at term results in some damage to the pelvic outlet. It is a common experience to find in women's clinics multipara with more or less relaxation of the pelvic floor. Many of these patients have been repaired according to the usual obstetrical procedures, which have proved unsatisfactory.

Leading gynecologists, including Lawson Tait and Emmet, have given to the profession good operations for the late repair of these neglected conditions, but obstetricians have not utilized similar good operations for the prevention of pelvic floor relaxation.

The author presents a perineorrhaphy, based on well-known surgical principles, which includes the restoration of the functions of the levator ani muscles. The various steps in the operation are illustrated by excellent drawings.

The operation consists in placing figure-of-eight silkworm-gut sutures through the levator ani muscles, skin, and fascia of the perineum with continuous gut stitches closing the lacerations of the vagina.

MISCELLANEOUS

McAuliff, G. R.: Hypertrichosis, Variations in Female Secondary Sexual Characteristics and Internal Secretions. *J. Am. M. Ass.*, 1916, lvi, 15.

The condition is thoroughly discussed in all its phases. The author summarizes the question as follows:

It is evidently a disturbed pluriglandular equilibrium, for at times we see a suprarenal causation, at others a pineal and occasionally a hypophyseal. These glands form a connected system, therefore it is to be expected that just as is the case in the hematopoietic system, a pathologic system, a patho-

logic process which becomes established in one part will cause disease to a greater or lesser extent in the other. The internal secretion of one gland reaches another through the circulation and there either directly increases or inhibits functional activity or increases or decreases its efficiency; or, again, it reaches the central nervous system and there produces impulses which indirectly influence the secretory cells. The function of the suprarenal, pituitary, pineal, and thymus act in an inverse proportion to that of the ovary, or in a compensatory or synergistic manner, for with hypertrophies of the former we see atrophy of the latter. Such a synergistic action exists not only between the ovary and this group of glands, but also between these glands themselves, for there is a pituitary hypertrophy following thyroidectomy, and acromegaly with suprarenal atrophy.

The thyroid and ovaries, on the other hand, have an antagonistic or neutralizing action on each other, for their functions vary in direct proportion, that is, the thyroid hypertrophies when the ovaries are most active, as in puberty, pregnancy, and menstruation.

If we accept such an interrelationship, it is justifiable to assume that the suprarenal is the gland principally concerned with sexual characteristics, the pineal next, and then the hypophysis, ovary, thymus, and thyroid, in order of importance. That one functionally imperfect gland alone is unable to produce marked hypertrichotic changes is seen by a case, reported by Pitt, of four suprarenal capsules; by cases of hypophyseal lesions, and by numerous cases of ovarian cysts, the great majority of which never are accompanied by hypertrichosis. Rather it must be concluded that at the basis must be some profound and complex disturbance of the antagonistic and synergistic pluriglandular equilibrium.

A case is reported as occurring in a woman 63 years of age. Her first confinement (normal) occurred at the age of 19 and was followed in two years by a second, which was likewise normal. After that she had an abdominal pain of a continuous dragging nature. She visited a gynecologic clinic in Vienna where a diagnosis of ovarian tumor was made.

About this time she noticed an increased growth of hair on the upper lip. Four years later a beard developed and she was accustomed to shave about every week. There were never any other hypertrichotic changes noticed. The family history revealed a similar condition in a daughter, aged 43, who had observed an increased growth of hair on the upper lip for thirteen years. At operation a dermoid cyst was removed from the mother. EDWARD L. CORNELL.

Block, F. B.: Some Observations on the Treatment of Dysmenorrhea. *Am. J. Obs., N. Y.*, 1915, 1131, 945.

From the abundance of articles on the subject of dysmenorrhea the author reasons that the condition is very common, and yet a subject which is not clearly understood. In this article he does not try

to discuss the various types of dysmenorrhea which are dependent upon pelvic inflammations, tumors, etc., but, with the single exception of the obstructive, considers only the cases in which the pelvic organs are apparently normal. The classification and treatment recommended is best shown in the following table.

Type	Symptoms	Cause	Treatment
Obstructive	Primarily and chiefly pelvic, but may not be one or two years. Pain disappears as flow becomes profuse.	Obstructing to lower uterine segment or vagina.	Removal of obstruction.
Ovarian	Isolated ovarian pain synchronous in onset with the appearance of the flow, commencing gradually and passing off before menstruation flow is established.	Increased ovarian secretion.	1. Increased temperature. 2. Hypoosmotic treatment of adrenals.
Vagotonic	Severe lower abdominal cramps and other symptoms suggestive of the obstructive type.	Increased excitability of the autonomic nervous system.	Large doses of ergotamine 2 days or less before the expected period.

In conclusion the author expresses the hope that the promiscuous dilatations and curettage and the antidysemenorrhea proprietaries may soon be just history.
C. H. DAVIS.

Dunlap, E.: Unsolved Gynecological Problems. *Texas M. News*, 1915, XXV, 124.

There are several subjects in gynecology about which very little is known, any one of which would furnish abundant interest for a careful research worker, surgeon, or therapist. Generally speaking, these points are:

1. Disputed and indefinite points concerning etiological factors. There is discussion at present as to the etiology of fibromata.

2. Unknown phases of the physiological action of various organs. The internal secretions are now under discussion. Pituitary, thyroid, parathyroid, adrenal, and thymus glands, if disturbed in function, will occasion alterations in the sexual organs.

Amenorrhea is an early symptom of overfunction or underfunction with respect to hypophyseal disorders.

3. Problems of treatment and operative technique. The question of the influence of radium upon fibromata and upon cancerous growths is an absorbing topic.

4. The grave questions connected with all major surgery must affect gynecological surgery—shock, adhesion, post-operative gas pains and distention, the unknown condition which protects against septic peritonitis at one time, and then under apparently similar conditions, allows a fatal termination.

R. H. KINGS.

Griffith, F. W.: The Sterile Woman. *South. M. J.*, 1916, ix, 154.

It is with relative sterility in woman that this paper deals. The author outlines the etiological factors as follows:

1. Leucorrhœa alone is sometimes sufficient by mere mechanical washing away to impede the entrance of the spermatozoa into the cervix. If in addition there should be a mild infection, gonorrhœal or otherwise, the likelihood of conception would be still less.

2. In a retroverted uterus which points downward and forward there is probably a sort of pouch formed behind the cervix where the semen is deposited and from which its entrance into the cervix is difficult.

3. If for any reason the secretion of the glands of the lining of the cervix becomes profuse and is dammed back into the glands and forms cystic nodules — nabothian follicles — or becomes thick and plugs the cervical canal, the progress of the spermatozoa is barred.

4. Besides the gonococcus, almost any other bacteria introduced from without will cause trouble. Tampons and other local treatments frequently cause an endocervicitis with a resulting sterility.

5. Polypi or a submucous fibroid large enough to fill the uterine cavity may offer some hindrance.

6. Malposition of the uterus is also an important factor in producing abortion.

7. Sometimes myomata interfere with impregnation.

8. The tubes are sometimes the cause of sterility: (1) Sometimes the lumen of the tube is so small that even congestion of the mucosa is sufficient to create at least a temporary if not a permanent obstruction to the canal. (2) Angulation from adhesions ever so delicate as a common cause. (3) Cobweb adhesions about the fimbriated end which interfere with the patency of the tube is another cause of sterility.

9. Chronic inflammation, the thickened tunica externa, and multiple cysts have been blamed.

Relative sterility should be treated under the following heads:

1. The underweight, anæmic woman should be built up.

2. Abundant rest and a mental condition free from worry should be encouraged.

3. Correct diagnosis is the first and indispensable step.

4. Too frequent sexual excitement should be discouraged.

5. A thorough disinfection of the vagina is usually indicated.

6. The vagina should be swabbed with tincture of iodine or one of the silver preparations.

7. There should be free passage through the cervical canal, a plastic operation being done if necessary.

8. When cervical secretions are hard the canal should be swabbed with carbolic acid and alcohol or the cautery should be used.

9. In congested cervixes with profuse leucorrhœa of normal appearance tampons of glycerine or ichthyol and glycerine should be applied.

C. D. HOLMES.

Wood-Comstock, B.: Visceroptosis in Women. *South. Calif. Pract.*, 1916, xxx, 39.

Lack of proper muscle control, due to muscular weakness, not only of the abdominal muscles themselves, but of the gluteal muscles and muscles of the back, the normal tonicity of which keep the body in proper poise, is one of the causative factors in this condition.

It is to this factor particularly that the author wishes to call attention, believing that if we recognize its importance and direct the treatment, both prophylactic and curative, along this line, the results will be much more satisfactory than they have been in the past.

If the gluteal muscles and the erector spinæ are weak, we find, because of their chronic relaxation, a long line between the posterior infrascapular border and the iliac crest, producing the straight back instead of the graceful curve denoting strength. Anteriorly the costal margin approximates the iliac crest; the abdominal wall becomes convex instead of straight, the greatest diameters being below the waist line instead of above. Associated with this a vitiated method of respiration with inadequate expansion at the lower thoracic line produces a combination of forces, making it impossible for the viscera to remain in that part of the abdominal cavity where they would normally be if they had ample room above and proper support below.

It can readily be seen that the supporting power of the abdominal muscles depends not only upon their own strength, but also upon their relation to the outline of the abdominal cavity as determined by the tonicity of the muscles of the back. If the correct relationship between these two great sets of muscles be not maintained, descent of the organs is inevitable.

The treatment for the intestinal stasis must of necessity be symptomatic at first, as it is impossible to correct the sluggishness of the bowel until the basic local and general neuromuscular tone is increased. The efficiency of the treatment will be increased if the patient receives a goodly amount of fresh air and sunshine, resting in bed as much as possible out of doors. The need of physical training should not be overlooked.

EDWARD L. CORNELL.

Judd, A. M.: Gonorrhœa in Women. *Long Island M. J.*, 1916, x, 22.

The author is pessimistic regarding the treatment and cure of gonorrhœa in the female; owing to the lack of control of institutional and private patients he is especially careful in regard to giving a positive statement whether or not a patient is cured. Protracted treatment is the keynote in the management of this disease.

The presence of the gonococcus is only proved when the bacteria are found in characteristic groupings, in leucocytes, when they are gram negative and when they correspond morphologically to the gonococcus. Material is best obtained by curettage of diseased area. Culture is the most positive means of diagnosis. Complement fixation test which is negative after a previous positive test is extremely valuable in estimating a cure.

The anatomical structures invaded are Bartholin's glands, the urethra, glands about the vestibule, cervix, and vagina less often. Extension is by direct continuity along the endometrium to the tube, resulting in pyosalpinx. This extension by continuity causes primary involvement of the tubes and secondary involvement of pelvic cellular tissue in a small number of cases, thereby differing from the pyogenic organism which enters the lymph and blood stream and causes secondary involvement of the tubes after invading the cellular tissue of the pelvis.

There is great uncertainty as to the time of onset because of the insidious transitory character of the initial symptoms.

The symptoms are those of an acute inflammation differing according to the anatomical structures involved. The treatment depends upon the stage of the disease and the structures involved. In acute cases absolute rest and light diet are advised. Cleanliness, and non-interference prevent extension of the disease. In chronic cases, protracted treatment, silver salts, destruction of skenes and the vestibular glands by means of actual cautery, is the procedure. The same method of cauterization is used for cervical infection.

Curettage and iodization of the endometrium are advised if involvement of the appendages can be ruled out. Diseased adnexa are treated surgically after conservative treatment has been thoroughly tested. Conservative or complete surgery depends upon individual conditions. The cervix is the guide whether or not supravaginal or complete hysterectomy is indicated.

The author reports 21 cases treated in public institutions with the following results: 4 cases in hospital at time of report; 3 cases—radical surgery—discharged as cured; external genitalia still showing evidence of neisserian infection; 12 cases left the hospital against advice; 1 case doubtful as to gonorrheal infection; 1 case discharged as recovered.

In conclusion the author states that only one patient of the total 21 recovered entirely. This case was kept under control by means of the Children's Society. He emphasizes the necessity of the medical profession finding some means of controlling these carriers of infection so as to limit the sources of infection.

Kroenig: Borderline Between Operative and Non-operative Treatment in Gynecology and Obstetrics (*Grenzüberschreitungen zwischen operativer und nicht operativer Behandlung in der Gynäkologie und Gynäkologie*). *Berl. Klin. Wochenschr.* 1916, lxx, 73.

Local surgical treatment of gynecological conditions has recently been losing ground in favor of conservative treatment because of the results shown by statistics. Even large accumulations of pus due to gonorrhea, tuberculosis, or septic processes, which were formerly always subjected to surgery, recover under conservative treatment, and the mortality is less than after surgical treatment. A careful study of the statistics shows an undoubted balance in favor of conservative treatment. The question of treatment of tuberculosis of the adnexa is not definitely settled, but the tendency seems to be in favor of the conservative method, as genital tuberculosis is a secondary disease and is largely dependent on the course of the primary tuberculosis. The same is true of tuberculosis of the peritoneum. There has been a tendency to overestimate the value of surgical treatment in psychic disorders in women. The part played by the mind in surgical conditions is illustrated by the fact that there has been a great decrease in the number of appendix operations since the war; attention has been distracted from the appendix by more important considerations.

In the treatment of myoma operation gave good results, but at the expense of 3 to 7 per cent mortality, opening the abdomen with the attendant danger of paralytic ileus, three to five weeks in the hospital and three to five months of convalescence with a consequent serious loss of time from work. Compared with this roentgen treatment gives no mortality and brings about amenorrhea with the loss of only a few hours' time, particularly since the introduction of the use of properly filtered rays.

In the treatment of carcinoma the opinion is gradually gaining ground, as the result of statistics, that irradiation should be given the preference over surgical treatment. Statistics of 209 carcinoma cases at the Freiburg clinic show 12.6 per cent of the patients alive after three years, 6.3 per cent after five years, 3.4 per cent after seven years, and none after ten years. This is exclusive of carcinoma of the body alone, which shows 70 per cent of recoveries after surgery and also after radium treatment.

In contrast with gynecological conditions, operative treatment has gained ground in obstetrics, particularly in the use of the cesarean section. This is due to the large percentage of children that can be saved by cesarean section. On the other hand forceps delivery has decreased, particularly since the introduction of Kroenig's twilight sleep.

A. Goss.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Cutter, I. S. and Morse, M.: Experiences with the Klutzel-Malone Urinary Test for Pregnancy. *J. Am. M. Ass.*, 1916, lxxv, 339.

The authors reach the following conclusions:

1. There are many objections to the method from the theoretical aspect.

2. The experiments, while showing acceptable results in 66 per cent of the cases examined, yet leave a high degree of uncertainty in the remaining third.

3. The appearance of positive reactions in certain cases known to be negative are inexplicable, except as involving an ever-present error, such as the factors of bacteria, excreted pepsinlike enzymes, etc.

4. The test, as at present conducted, cannot safely be depended upon as a diagnosis of pregnancy, owing to: (1) the non-specificity of the reaction, and (2) the frequency of errors. EDWARD L. CORNELL.

Brown, W. L.: Eclampsia and Its Treatment. *Am. J. Obst.*, N. Y., 1916, lxxiii, 251.

After a general discussion of this subject the author reviews the results of the cases in his experience. There were 21 cases with a total maternal mortality of 9.5 per cent, and a total fetal mortality of 28.5 per cent, or if the same exclusions were made as in Peterson's table the fetal mortality was only 9.5 per cent. In 14 cases, or two-thirds of the whole number, convulsions developed before delivery, and in 7 the convulsions developed after delivery. Of the 14 antepartum cases, 10 continued to have convulsions after delivery, so that delivery did not prevent or stop the convulsions in 80 per cent of all cases. There were 11 operative deliveries and 10 spontaneous ones. One mother died after a spontaneous delivery and one after a manual dilatation and version. Of the children who were alive or viable at the time of delivery, one died after spontaneous birth and one after version, while the others were all stillborn before the thirty-second week. In the operative cases the delivery was done in one case before convulsions appeared; in one after the second attack; in one after the third seizure; in one after the fourth convulsion; in two after the fifth; in one after the eighth; and in one after the ninth. In all but one case the kidney manifestation was present in varying degrees. Hypertension was a common feature, although the cases that died had a lower pressure than the others. C. H. DAVIS.

Stein, A.: Vaginal and Abdominal Cesarean Section. *Am. J. Surg.*, 1916, xxx, 46.

The author reviews the progress made in the operative technique of abdominal and vaginal

cesarean section; outlines the technique of vaginal cesarean section; gives the methods of two new and distinct operations, the transperitoneal and extraperitoneal abdominal cesarean section; gives the indications for vaginal section; and discusses the treatment of eclampsia and placenta previa.

After describing the development of the operation of cesarean section from the time of Porro, the author quotes Nicholson's conclusions:

"The extraperitoneal suprasymphysical cesarean section is an addition to the obstetric armamentarium.

"Its chief indication is the 'neglected case' or one that is mildly infected.

"The transperitoneal technique is to be preferred to the true extraperitoneal because of the ease of performance, less interference with the bladder, and the avoidance of the contamination of the retroperitoneal and preperitoneal tissue areas.

"Subsequent pregnancy and labor are usually not influenced adversely.

"Repetition of the procedure may be more difficult, and in some cases it may be impossible."

Eisenreich reports 145 cases of extraperitoneal cesarean section performed at the University Clinic at Munich from 1908 until 1915. It was possible to operate 137 times extraperitoneally. Of these 137 cases extraperitoneally operated on, 9 died, which gives a mortality of 3.7 per cent. In 22 cases subsequent labor was observed; in 13 of these cases the section had to be repeated; in 7 of these 18 cases the second cesarean section could be done again extraperitoneally; in the other cases the transperitoneal method was adopted.

The author advises the use of pituitrin in all cases of cesarean section, the patient to receive 1 ccm. of pituitrin subcutaneously at the beginning of the operation. As to indications, the vaginal section is advisable in all cases in which the cervix is closed and indication for rapid delivery arises. The field for the operation is large, as it comprises all acute complications on the part of the mother or child up to about the seventh month of pregnancy, such as eclampsia, premature separation of placenta, pernicious vomiting, pulmonary edema, heart disease, and asphyxia in utero.

In regard to eclampsia, the author's opinion is that all cases require immediate and not conservative treatment, reasoning that it would be wrong to inject more poisons into a body which already is poisoned. At Dr. Brodhead's service at the Harlem Hospital they have decided to perform the vaginal cesarean section for eclampsia only up to the seventh or eighth month, and after that time the abdominal cesarean section, because the mortality, which was

up to a few years ago forty-eight per cent, has been brought down to about twenty-five per cent.

In placenta previa it is advisable in the centralis variety in which no infection is present, and only one pronounced hemorrhage has taken place, to perform either the classical or extraperitoneal cesarean section. Considering the high mortality of the mothers among non-operative cases, he thinks the abdominal cesarean section has come to stay as a rational method in the treatment of placenta previa centralis.

At the Harlem Hospital, from April, 1914, up to January, 1916, the vaginal cesarean section was performed in fourteen cases and the abdominal section in eleven cases. The vaginal cesarean section was performed nine times for eclampsia, three times for toxæmia of pregnancy, once for accidental hemorrhage, and once for a missed abortion of three months which was carried about five months. There were five deaths, not due to any operative interference but to the extremely serious eclamptic condition of the patients. Of the children, three died before the operation was commenced and altogether six were not viable, the operations being performed during the fourth to the seventh month.

The abdominal sections were done in seven cases for flat or contracted pelvis, in two cases for eclampsia beyond the seventh month of pregnancy, and twice for placenta previa centralis. All of the patients except two made uneventful recoveries. Of these two, one died of empyema and general sepsis due to probable infection prior to the operation and the other died from severe eclampsia which continued after the operation. RALPH H. KUHN.

Norris, C. C.: Pulmonary Tuberculosis and Pregnancy. *Penn. M. J.*, 1916, xix, 328.

That pregnancy exerts an unfavorable influence on the course of tuberculosis is generally admitted. Statistics show that about 39 per cent of tubercular married women believe their infection dated from pregnancy or the puerperium.

To treat these cases each must be thoroughly studied and individualized. Cases in which the lesions are limited in extent and not progressing are the most favorable.

As a general rule the tubercular woman should not marry, certainly not when there is an active pulmonary lesion. A woman with a lesion which has been quiescent two or three years may be permitted to marry. But the tubercular woman should avoid conception. Exceptionally—an intelligent patient with a small inactive lesion of two years' duration, who can avail herself of proper care and treatment may be permitted to become pregnant, but she should be watched carefully.

When pregnancy has occurred without advice, the treatment must depend on conditions, the social status, the financial condition, the mental attitude, the intelligence of the patient, etc.

Before the fifth month with an active lesion or an extensive quiescent lesion the uterus should be

emptied at once. Laryngeal or secondary lesions, excessive vomiting, and renal insufficiency may all be indications for emptying the uterus.

With a quiescent lesion of moderate or small extent, the patient must be studied individually before a decision is reached, always remembering that intervention in the later months is of little value.

The prognosis should always be guarded even if the uterus is emptied.

In choosing the method of terminating the pregnancy, dilatation and curettage is advised during the first six or seven weeks, in the later weeks vaginal hysterotomy.

Operation is not indicated during the last four or five months of pregnancy. The patient's strength should be conserved and forceps used to terminate labor as rapidly as possible.

Nursing should be forbidden for the sake of both infant and mother. D. H. BORN.

Croothwalt, W. L.: Appendicitis During Pregnancy. *Texas M. News*, 1916, xxv, 317.

Appendicitis during pregnancy is common, but there is nearly always a history of previous attacks. The author observed ten women who had had, prior to conception, repeated attacks of appendicitis. Six of these had recurrences during their first pregnancies. Four were operated upon early in the attack without any post-operative disturbances. In the other two suppuration had taken place and drainage was required, the one being operated upon at the seventh month and the other at the time of parturition. Pregnancy predisposes to these recurrences, or even to first attacks, because the increased demands on the system favor the development of local points of infection. The severity of the symptoms determines the course of treatment. Pregnancy itself is not a contra-indication to operation. The tendency to abort is due to the toxæmia of the appendicitis rather than to the operation itself.

Perforation of the appendix and peritonitis during pregnancy are much more severe for the following reasons: (1) Protective adhesions are less likely to form. (2) Inflammation is more intense owing to the greater vascularity of the parts. (3) The peritoneum of the upper abdomen is more often involved, where the lymphatic absorption is greater. (4) The infection spreads under and around the uterus and drainage is interfered with. (5) Muscular rigidity and tympany embarrass respiration and predispose to pneumonia and pleurisy. (6) Obstruction of the bowel is more apt to occur, especially in the later months of pregnancy. (7) If an abscess becomes walled off the chances are that it will rupture at the time of labor.

If the operation is performed between the first and fifth months a right rectus incision is suggested in order that the tubes may be inspected. After the fifth month a higher incision and liberal drainage are advised. If abortion is inevitable the uterus should be emptied. If there are evidences of

uterine infection Porro's caesarean section is recommended.

C. D. HATCH.

Litzenberg, J. C.: A Study of Liver Function in Normal Pregnancy. *Am. J. Obst.*, N. Y., 1916, LXXX, 228.

This study is based upon the examination of 271 cases. The urine of 71 healthy non-pregnant women was examined and in no case was urobilinogen or urobilin found. In 200 cases of so-called normal pregnancy 62 gave the reaction for urobilinogen or urobilin, or a proportion of 31 per cent. From the statements of those who have studied these substances in other fields, that urobilinogen or urobilin in the urine means either increased blood destruction or inefficiency of the liver, the author concludes that in the absence of blood dyscrasia, there must be interference with the function of the liver during, and on account of pregnancy, unless the woman has some disease which causes functional disturbance of the organ, such as congestion of the liver in cardiac decompensation. Excluding cases which might be due to other causes than pregnancy there were 25 per cent, with urobilinogen or urobilin distinctly attributable to pregnancy, suggesting the possibility of a "liver of pregnancy."

C. H. DAVIS.

Hirst, J. C.: Corpus Luteum Extract in the Nausea of Pregnancy; Preliminary Report. *J. Am. M. Ass.*, 1916, LXVI, 645.

The author's use of corpus luteum extract in the treatment of the nausea of pregnancy is based on the presumption that there is more than a coincidence between the formation and disappearance of the corpus luteum of pregnancy and the cessation of the nausea. None of the theories based on the causative factor of foetal or syncytial toxins has worked well enough to encourage the hope that in them lies the solution of the problem. It is not unreasonable to suppose that there is sufficient absorption from the corpus luteum of pregnancy to account for the disappearance of the nausea, especially when one realizes that the nausea begins to diminish at the time the corpus luteum has reached its acme of development.

Acting on this idea, the author has been administering, hypodermatically, corpus luteum extract in doses of 1 ccm. (20 mg.) daily.

Five cases are briefly reported, four of which were successfully controlled.

EDWARD L. CORNELL.

LABOR AND ITS COMPLICATIONS

Jardine, R.: Delay in Breech Presentations from Extension of the Legs. *Glasgow M. J.*, 1916, LXXX, 81.

In breech presentation when the legs are extended, the descent is usually arrested before the pelvic floor is reached and in many cases before the breech has entered the brim of the pelvis. The reason for this is not because the legs act as splints preventing

lateral flexion of the body as in normal delivery, but because descent is prevented by the action of the retraction ring in the uterus. In these cases the membranes have usually ruptured early and the uterus contracts down around the body of the child before the cervix is dilated, resulting in the formation of the retraction ring. When the ring has formed, a sulcus can be seen running across the abdomen between the pubes and the umbilicus, but it can also be felt internally before it can be seen externally by passing the hand up along the body of the child.

The treatment consists in dilating the os manually if necessary, grasping one foot and drawing it down through the os, and delivering the child by having pressure made on the fundus above. The pressure from above keeps the head flexed and prevents the arms from becoming extended. Drugs apparently have no effect in relaxing the ring.

D. H. BOYD.

Howat, R. K.: The Immediate Treatment of Severe Post-Partum Hæmorrhage. *Brit. M. J.*, 1916, I, 193.

While the term post-partum hæmorrhage is one which in its accepted clinical significance is incapable of exact defining, it is referred to by the author as an abnormally severe hæmorrhage from the parturient canal occurring within twenty-four hours after the birth of the child.

There are three causes of post-partum hæmorrhage: (1) laceration of the parturient canal, (2) retention of the placenta (partial or complete) within the uterus, and (3) inadequate shrinkage of the uterus.

Treatment has three successive objects: (1) the immediate arrest of the hæmorrhage, (2) the immediately succeeding maintenance of the arrest, (3) the permanent closure of the bleeding vessels. For the third cause of hæmorrhage, the sudden relaxation of the uterus after the expulsion of the placenta, the author describes his predetermined line of treatment. This can be carried out practically alone and consists in pressure first over the abdominal aorta to cut off the blood supply, then a rapid change in the position of the hand to grasp the fundus and with the other hand in the vagina, not in the uterus, a bimanual ante-flexion of the fundus and cervix, pressing the anterior and posterior walls together between the two hands. Immediately after this the patient's pelvis is lifted by an assistant, and while thus raised an inverted chair is placed under the patient to improvise an exaggerated Trendelenburg position.

When the uterus is firmly contracted the vaginal hand may be withdrawn and a vulvar dressing and firm abdominal binder applied. The elevation of the pelvis to 30 degrees should be maintained for at least seven hours. The proximal pressure compression of the aorta is the first maneuver because it can be most quickly applied and it tends to check the arterial supply of blood.

The bimanual pressure has three objects: (1) to block the open channels of the placental site,

(1) to empty the uterus of blood, (2) to stimulate the uterus to contract. There is not as great a degree of sepsis if the lower hand is not inserted into the uterus. Elevation of the pelvis is emphasized because of its use in this form of hemorrhage, its ready applicability, its tendency to lessen shock, its prompt and effective action, and because it is independent of environment. PHILIP F. WILLIAMS.

PUERPERIUM AND ITS COMPLICATIONS

Warren, S. A.: *The Prevention and Treatment of Puerperal Fever*. *Texas M. News*, 1913, XXV, 238.

Warren believes that prevention of puerperal infection begins with prenatal care. The bodily functions should be made normal and the various channels of elimination opened. The author does not believe in the so-called prophylactic vaginal douche during labor and maintains that the real issue is careful asepsis combined with as few vaginal examinations as possible.

After the onset of puerperal fever he advises digital exploration of the uterus under anesthesia and the removal of any secundines or clots found, followed by a copious intra-uterine douche of weak antiseptic solution. If the uterus cannot be evacuated thoroughly with the finger he advises the use of the large dull curette. He also institutes drainage of the uterus with iodoform gauze soaked in glycerine in cases where there is much enlargement or congestion of the organ. F. C. IRVING.

MISCELLANEOUS

Morgan, H. J.: *Care of the Newborn*. *Pediatrics*, 1913, XXVIII, 51.

The bringing into the world of children has been the duty of the physician from time immemorial, and theoretically he has supervised their bringing up after they have arrived. Unfortunately, in the greater number of cases his real interest in the child often ceases after he has cut and tied the cord, heard the child cry, and has examined it for deformities.

In this brief review of the care of the newborn, no claim is made for originality. The author merely outlines a course that has proved practical, not only in private practice, but in hospital work.

Needless to say, the greater proportion of babies will still be cared for by those who do not wish to enter the specialists' field, so that a logical step toward efficiency would be to teach simplicity in the routine of such care.

Let us then weed out the unnecessary and obsolete. Let us demand of our hospitals that the pediatric department be turned over to one who is really interested and that they cease to use this staff position as a sop to the pride of some man who fails to make any other staff position; that the nurses be given real training in this branch of medicine as well as in surgery — if necessary, by an exchange of time with a real baby hospital — and that the

mother shall feel that good advice in these regards may better be sought from the physician than from the popular magazines, whose pages, full of misinformation on these topics, only accentuate the fact that physicians as a class are not at present satisfying this want of the mothers.

EDWARD L. CURRIE.

Ballantyne, J. W.: *Antenatal Clinics and Prematernity Practice at the Edinburgh Royal Maternity Hospital in the Years 1909 to 1915*. *Brit. M. J.*, 1916, I, 189, 234.

The antenatal work in the service of the author is described in some detail. The methods of the prematernity nurse in the extern department are very similar to those employed by the prenatal visiting nurses in this country. A follow-up card system and systematic instruction of expectant mothers has caused many women to enter the prematernity ward for various ailments during pregnancy. A great variety of maladies complicating pregnancy passed through the ward during the service of the author. A short history is given of some of the most interesting cases, including two cases of chorea, of which one with acidosis died; the other recovered under treatment with calcium chloride, went to term and was delivered of a living child. Practically all cases of toxemia of pregnancy with marked renal symptoms have been treated as actual eclampsies by a conservative method with good results. The lessening of the fetal mortality and maternal morbidity have justified the prematernity practice of the Royal Maternity Hospital. PHILIP F. WILLIAMS.

Moran, J. F.: *The Endowment of Childhood from the Obstetric Standpoint*. *J. Am. M. Ass.*, 1913, LV, 7224.

The importance of the subject does not arise from the frequency with which its problems are presented, but from the grave emergencies created by them—emergencies which demand early recognition and prompt decision by the physician in that they involve the lives of the mother and child, as well as points of professional honor and conscience. The author is deeply impressed with the difficulty which often presents itself of deciding when to interfere and what particular method of intervention to elect. In no other field of medicine is well-balanced judgment and skill more requisite for success; and, not infrequently, even then the result is tortuous.

The figures of the death toll of early infancy are appalling and show that, besides the unavoidable mortality incident to childbirth, many infants are born hopelessly handicapped for life's struggle, while many others perish through ignorance and neglect.

In this connection the author reviews 10,143 confinements which occurred in the obstetric service of Columbia Hospital from July 1, 1896, to June 30, 1911. They were divided as follows: stillbirths, including abortions, 716; living births, 9,817.

TABLE OF GENERAL MORTALITY

Cause	No.	Per Cent
Unknown	343	24
Prematurity	230	15.5
Accidents of labor	122	11.7
Syphilis	106	7.9
Immersion	99	7.9
Asphyxia, partial	56	4.1
Asphyxia, accidental	11	.8
Patulous foramen ovale	11	.8
Toxemia and eclampsia	46	3.4
Enteritis	40	2.9
Placenta previa	30	2
Accident (violent)	28	2
Hemorrhage of the newborn	26	1.9
Atelectasis	30	2
Accidental hemorrhage	23	1.7
Pneumonia	19	1.4
Malduration and monsters	15	1
Convulsions	14	.8
Miscellaneous	38	2.8

It will be observed from the table that the "unknown" forms the largest contingent of fetal deaths—nearly 50 per cent of the stillbirths and 24 per cent of the total infant mortality. This is because diagnosis was usually based on clinical data and often incomplete history, and frequently because a satisfactory explanation was wanting. Routine Wassermann and other laboratory tests and necropsies would surely have proved that many of this group were due to syphilis. Bearing on this point, the following data is of much significance. Of 171 Wassermann tests taken in the past four years in the obstetric department, 113 were positive, and out of this number 35, or 30 + per cent, were stillbirths. Out of the 58 negative reactions there was only one stillbirth. It would probably be a safe estimate to say that at least 40 per cent of the unknown stillbirths were caused by syphilis.

The summary emphasizes the indubitable fact that there is a needless sacrifice of infants because of the neglect of prenatal care, and that early recognition of abnormal conditions and timely intervention would have averted many of the intrapartum disasters.

The public should be taught that the risks attending parturition can be, for the most part, avoided by intelligent oversight of the parturient; by preparedness for rendering aid when needed no less than by masterly inactivity when normal.

Much good is being accomplished by the various organizations engaged in the welfare of motherhood and childhood, by stimulating general interest in the cause and securing lay and professional co-operation; but if this much-to-be-desired beneficence is to become nation-wide, the checking and follow-up system can be satisfactorily done only under state subsidy and control.

The keynote to decreasing the appalling infant mortality is good obstetrics, and the watchword is efficiency—efficiency in prenatal care—so that at the time of birth mother and child shall be in the best possible condition, and efficiency in the conduct

of labor, whether it be in the rôle of "watchful waiting" or masterly activity, in order that the child shall be assured its inalienable right to be born alive and healthy and the mother safeguarded to a successful and happy fruition of her noblest mission in life—maternity. EDWARD L. CORNELL.

Paine, A. K.: Technique of Nitrous Oxide Administration in Obstetrics. *Surg., Gynec. & Obst.*, 1916, XXII, 243.

Clinical experience with the use of nitrous oxide for the relief of pain during labor, has demonstrated certain facts upon which the technique of its use is based. The analgesic state is sufficient to practically eliminate pain during a uterine contraction. This state may be induced so quickly that the inhalation of gas is only necessary during the contraction. The amount of gas inhaled is so small and the period of inhalation so short, with each pain, that no cyanosis results and therefore the use of oxygen is unnecessary.

Nitrous oxide is practical for the relief of pain from the beginning of severe pain until the time when obstetric ether would ordinarily be used. The latter is not supplanted by the use of nitrous oxide with advantage.

The technique of administration is as follows: When the pains are sufficient to cause appreciable suffering, its administration is begun. The apparatus consists simply of a face piece with the usual rubber bag attached by a length of tubing to a gas tank. Between pains enough gas for five or six inspirations is allowed to enter the bag. With the beginning of contractions, the patient breathes deeply and rapidly, rebreathing once or twice into the bag, if necessary. This procedure is sufficient to secure an analgesia which lasts from one to one and one-half minutes. The patient does not lose consciousness and is, herself, generally able to recognize the analgesic state. The inhalations are repeated with each succeeding pain and may be continued for five or six hours without appreciable ill effects.

During the stage of expulsion, obstetric ether is substituted for the gas, the former favoring a better control of the force of uterine contractions.

Bishop, H. D.: The Knee-Chest Position as a Means of Prevention of Obstetric Morbidity. *J. Am. Inst. Homoeop.*, 1916, viii, 553.

The author states that there are three essentials to the prevention of morbidities resulting from childbirth, two of which are aseptic technique before and after labor, and repair of injuries incident to the traumatism of labor; the third essential is the routine use of the knee-chest position in the puerperium as the principal means of securing a normal involution.

The routine during the puerperium is as follows. The patient is compelled to take the erect position for urination and bowel movements after the first

forty-eight hours, getting out of bed if it is of ordinary height, this being done even if there has been a repair of the soft parts. After the fifth day the patient has a back-rest during meals. After the ninth day she sits up in a chair for meals. The knee-chest position is taken once daily after the fifth day and continued until the eighth week. If at any time there is backache following exercise or exertion, the knee-chest position is taken more than once daily. The author states that this position is an absolutely useless procedure if it is unaccompanied by air distention of the vagina. This is done by inserting a half-inch glass tube, eight inches long and bent to a right angle.

The author's results are summarized as follows:

1. Whenever there has been a lessening in the amount of the lochia it has always returned to normal in a very short time.

2. Formerly, when a patient had a too profuse lochia coming on after beginning to sit up and move about the room there was nothing to do but put her back to bed, or at least restrict her moving about. The author finds that the knee-chest position preceding all of her rest periods is the more successful treatment.

3. The reappearance of the menses in a nursing mother is less often noted.

4. A febrile condition due to retention of lochia will disappear promptly with no other treatment. In such cases the treatment should be given at least every four or six hours until a normal amount of flow has been re-established. RALPH H. KENNEDY.

Harman, N. B.: The Influence of Syphilis on the Chances of Progeny. *Brit. M. J.*, 1916, I, 196.

The effect of syphilis upon the childbearing capability of a woman is well-known, but there are few definite figures that give this common knowledge in an easily remembered fashion; for this reason

the figures presented in this paper should be of interest. In his work as an ophthalmic surgeon the author had occasion to investigate 150 family histories where the blindness in the children was the undoubted effect of parental syphilis. The diagnosis of the congenital or inherited syphilis was made upon the clinical findings, which included interstitial keratitis, iritis, or disseminated rheumatism, in addition to which there were very often found confirmatory signs, as Hutchinson's teeth, bone and joint disease, ulceration of the palate and nose, etc.

The obstetrical histories of these 150 families are interesting in themselves; but the contrast afforded by a comparison with 150 untainted families is striking. The difference between the results of fertilization of these two sets of women is remarkable. The 150 syphilitic mothers had 1,001 pregnancies, but of these only 390 resulted in presumably healthy children; on the other hand, 150 healthy mothers had 826 pregnancies and from these there resulted 654 healthy children. There were 93 miscarriages in the syphilitics, 61 in the healthy mothers; 50 stillbirths in the syphilitics, 17 in the healthy mothers; 220 infant deaths in children of syphilitics with only 94 in the children of healthy mothers, and 210 cases of syphilis in the offspring of the first group.

That the syphilitic mothers had 17 per cent more pregnancies than the healthy mothers may be accounted for in part by the frequency of stillbirths and miscarriages in the syphilitics. The short interval between many of these would allow of several ineffective pregnancies within the same time as would be taken for one full pregnancy in a healthy mother. Further, the desire for children may have increased the number. The moral is obvious, the figures speak sufficiently of the influence of parental syphilis on the chances of healthy progeny. PHILIP F. WILLIAMS.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Elaendrath, D. N., and Kahn, J. V.: *Rôle of the Lymphatics in Ascending Renal Infection; Preliminary Report. J. Am. M. Ass., 1916, lxxv, 581.*

The authors have just completed a series of 27 experiments on dogs and rabbits, which show that infection travels from the bladder to the kidneys and perinephritic tissue by way of the lymphatics in the wall of the ureter and not along its mucous membrane. The lymphatic capillaries of the periureteral sheath, in laboratory animals as well as in the human being, play a most important part in ascending infection. The constant finding of evidences of infection in the immediate vicinity of the rich network of periureteral blood-vessels makes it seem plausible that infection can travel, as Sampson and Bauereisen assert, to the kidneys from the female genitalia and other abdominal viscera which lie in close relation to the ureter.

In the early stages of infection, the infiltration is found in the submucous layer of the bladder and is especially dense around the smaller vessels in this layer. The infiltration can then be followed up into the ureter where, as in the bladder, it is most marked in the submucous coat in the lowermost portion of the ureter. A little farther up, however, in addition to the submucous infiltration, a new factor is introduced. The periureteral sheath is then seen, composed of loose areolar tissue in which many blood-vessels lie. This plays an important, if not the chief, part in transmitting the infection upward. Examination of serial sections longitudinally of the entire ureter shows plainly how, in the early stages, the infiltration around and in the walls of the blood-vessels of the periureteral sheath is the earliest and most constant finding. As the infection progresses, the other coats become invaded from without inward, the mucosa remaining intact, until the infection is well advanced. We find the same sequence of changes in the human ureter.

In the kidney pelvis the infiltration is first seen in the subpelvic areolar tissue, and again around the blood-vessels, the overlying mucosa remaining intact. Within the kidney the author's experimental work confirms the observation of Mueller in the human being.

EDWARD L. CORNELL.

Keyes, E. L., Jr.: *Mechanics of Renal Infection. Lancet-Clin., 1916, cxxv, 121.*

Mechanical abnormalities, the presence of stone and lack of drainage favoring bacterial invasion, are the chief causes of renal infection. Rational treatment, therefore, consists in the removal of the mechanical obstacle, thus providing good surgical

drainage; in fact the axiom is justifiable, that with the removal of the mechanical difficulty the treatment is generally completed.

As proof of this the author cites the frequently observed infection of little girls, caused by mechanical disturbances of the upper abdomen encroaching upon the liver and kidneys, resulting in loose or movable kidney subject to congestion either from tension of the vessels or from kinking of the ureter, infection resulting. He also calls attention to the obvious mechanical cause and effect of puerperal renal infection and to the frequently observed fact that removal of ureteral stone is followed by cure in those cases only in which ureteral drainage can be established so perfectly that a nucleus for stone would not reform and be retained. The incompatibility of symptoms of renal concretions with their size and number, and similar seemingly incongruous conditions as regards the number and intensity of attacks of renal colic in both sexes are explainable on the basis of drainage, which is good in the man's patent ureter and poor in the kinked channel of the woman.

The cause for mechanical obstruction of the ureter may be very insignificant, for even a mere shave of crystals may cause violent renal colic and the author has operated on a case of obstructive anuria, only to find the two ureters and kidney pelvis impacted with crystals; he also cites another case in which bilateral ureteral occlusion with anuria occurred on the basis of a formation of gritty material.

Noteworthy are the author's therapeutical hints based upon these observations. For the relief of pain and to effect relaxation of spasm in an acute attack of renal colic, immediate administration of morphine is indicated. Thus retention is relieved by unfolding of the kink in the ureter, and the drainage of the stone is facilitated. The most important therapeutical value of renal lavage probably lies in the passage of the ureteral catheter, resulting in mechanical relief of slight obstructions.

Finally, the statement is ventured that unilateral suppurative nephritis is the result of a local mechanical trauma or retention which causes an acute infection from bacteria, previously in the kidney, while the real multiple infarcts that occur in the course of pyemia are as a rule bilateral, and since they are incurable they are void of surgical interest.

M. KROTOSZYNER.

White, H. S.: *The Vacuum Flushing Leech. Boston M. & S. J., 1916, clxvii, 86.*

White describes his invention of a vacuum-flushing leech applicable to vaginal, intra-uterine,

and urethral inflammations with exudate. He claims for it painlessness, continuous proper function, and the rapid mechanical removal of toxic products and their causal factors. The principle depends upon a vacuum chamber which is controlled by an exhaust pump and is connected with the leech. The leech is equipped with tips of proper shape and size for the various cavities to be treated and has ten thousand perforations to the square inch. This is in turn connected, as is the chamber, by a Y-tube with another chamber holding a solution of gas used therapeutically. He contends that by reducing the pressure from without the toxins and bacteria will seek the line of least resistance, or that created by negative pressure, and thus relieve the patient of many of the infecting bacteria and their products. J. EISENSTADT.

Macnider, W. de B.: The Inhibition of the Toxicity of Uranium Nitrate by Sodium Carbonate, and the Protection of the Kidney Acutely Nephropathic from Uranium from the Toxic Action of an Anæsthetic by Sodium Carbonate. *J. Exp. Med.*, 1916, xiii, 171.

The author presents a study of the toxic action of uranium nitrate on the kidney, both before and after the use of an anæsthetic, and of the inhibition of this toxic action which may be induced by the use of an alkali. The experiments were made upon animals and they showed the following results:

The toxicity of uranium in animals of different ages is associated with the power of the metal to lead to the formation of organic acids, as, for instance, diacetic acid and also acetone.

The power of sodium carbonate to lessen the toxicity of uranium depends upon its power to delay the formation of such bodies and to cause their appearance in the urine in lessened amounts, and does not depend upon the power of the carbonate to detoxicate the metal.

The protection of the kidney by the carbonate, which is shown by the kidney being functionally much more active during an anæsthesia than the kidney of a control animal, and by the lack of fatty degeneration, acute swelling, and necrosis of the renal epithelium which is constantly seen in the unprotected kidneys, is probably dependent upon two factors: the neutralization of organic acids formed prior to and during the anæsthesia, and the neutralization of hydrochloric acid which Graham has shown to be liberated by chloroform during an anæsthesia induced by this substance.

GEORGE E. HEILBY.

McLean, F. C.: Clinical Determination of Renal Function by an Index of Urea Excretion. *J. Am. M. Ass.*, 1916, lxxi, 415.

Of those tests depending on the introduction of foreign substances, that using phenolsulphophthalein is the most valuable. The lactose (for urea group) and potassium iodide (salt group) test of Schlayer and Takayasu is too difficult of application

and interpretation to be of great value. Tests involving a special diet, with measured nitrogenous and saline intake, are onerous and often misleading, e.g., when fever patients retain salts in their tissues. The value of the determination of blood urea is lessened by the great variability of this factor under normal circumstances; in many cases patients with marked nephritis have less urea in their blood than some normal individuals. Ambard recognized this and advocated the determination of the relationship between the concentration of the urea in the blood, and its rate of elimination. This he found to be quite constant in health but varying greatly in disease.

The author presents a formula founded on the work of Ambard and utilizing the several factors on which Ambard bases his conclusions, these being the urea excretion per diem, the urea per liter of urine, the urea per liter of blood, and the weight of the body. The resultant index of excretion closely parallels the phenolsulphophthalein coefficient, but seems to be more sensitive, especially when there is marked depreciation of the renal function.

S. W. MOOREHEAD.

Woodruff, S. R.: The Technique of Pycelography. *Surg., Gynec. & Obst.*, 1916, xvi, 241.

The author lays great stress on the fact that pycelography should be done with the patient under the X-ray tube, and every detail carried out with great care and gentleness. Collargol and thorium citrate solution (to which has been added enough methylene blue to give it color) are both used. The patient should be fully prepared as to bowels and clothing and placed ready for cystoscopy on a table with the X-ray tube in readiness above. It is much better if the table in its middle portion has an X-ray pervious top with an aperture to slide the plates under without disturbing the patient. When the ureteral catheter is in position, a cystoscope holder is used to steady the instrument and give the operator free use of both hands. The injection fluid is run in by gravity—the receptacle being held in the hand and not on a fixed stand—enabling the operator to raise or lower the pressure instantaneously. The patient lies on the table a half hour after the picture is taken in order to let the fluid drain away. The catheter is removed unless a cavity exists.

The injection is always made by gravity, the apparatus being simply the barrel of a 20-ccm. glass syringe with rubber tubing and stopcock to connect with the catheter.

The operator sits in front of the patient in the usual position, holding the injection apparatus in the left hand thus enabling him to raise or lower it at will. He glances from time to time through the cystoscope to see if any injection fluid is coming down alongside the catheter. The presence of this should be the signal for lowering the pressure of the injection fluid and for taking the skiagram.

Brausch, W. F.: Perinephritic Abscesses. *Calif. St. J. Med.*, 1916, xiv, 14.

Brausch reviews 101 cases operated on for abscess in the perinephritic tissues, discussing the etiology, the methods of diagnosis, the results, and conclusions.

In 34 cases he found that the abscess was secondary to lesions in the extra-urinary tissues and because of the situation were termed subdiaphragmatic or retroperitoneal abscesses; the other 67 cases were regarded as true perinephritic abscesses of which the ratio of male to female was two to one with practically an equal number on the right and left sides. The direct etiologic factors in their order of frequency were pyonephrosis, renal tuberculosis, nephrothiasis, cortical abscess, and traumatic abscess.

In this series, none was found to have originated from a primary pyelitis or pyelonephritis. In 18 patients no evidence of renal involvement was found on clinical examination, although in four cases there were symptoms suggestive of other sources of infection.

He emphasizes the use of the following methods not only for diagnosis but for differential diagnosis: (1) repeated urinalysis, (2) bacteriologic investigation of the urine catheterized from each kidney, (3) estimation of the comparative renal function, and (4) radiologic examination, including that of the urinary tract, of the thorax, and pyelography.

In the more acute types, no evidence of renal infection was found on clinical examination and the etiology was not ascertained at operation because of the exigencies of the cases, and the author infers that the small solitary cortical or subcapsular abscess was the cause of the unidentified perinephritic abscesses.

Of the 67 patients, 2 died as the result of the operation, and 3 within three months, in 18 the wound healed within one month, and in 25 the wound continued to drain from two to six months, and the fistula has persisted to the present time in four patients.

Brausch concludes that in the presence of a large fluctuating abscess and marked physical weakness drainage will suffice; if, however, evidence of considerable renal involvement has been found, immediate nephrectomy as well as drainage is to be preferred; but it is of practical importance to previously investigate the underlying renal condition.

LOUIS GROSS.

Van Cappellen: Carcinoma of the Ureter (*Carcinom des Ureters*). *Beitr. z. klin. Chir.*, 1916, xcix, 138.

The author gives the history of a female patient, aged 46, who came under his care in April, 1914. Based upon this history, clinical findings, cystoscopy, and laboratory analysis, a diagnosis of right-sided pyonephrosis was made. The findings of one tubercle bacillus-like organism was considered insufficient evidence on which to base a diagnosis of tuberculosis of the kidney. Existence of the

trouble for over 12 years likewise speaks against it. X-ray examination showed no stone.

The right kidney was exposed by lumbar incision. It was found to be the size of child's head; only a few adhesions were noted. Fluctuation was distinct and there seemed little renal tissue left; the vessels which were very thin were ligated; the renal pelvis and ureter were much dilated; the ureter was not removed but was simply cauterized with the thermocautery and ligated on account of the poor condition of the patient at this stage of the operation. The wound healed readily after four weeks.

Examination of the specimen revealed no evidence of tuberculosis. The urine after operation still contained some pus but not nearly so much as before operation. Continued urine examinations showed an increase in the quantity of pus. The patient complained of pain in the right lower abdomen, but of a different character than before operation. Severe hematuria occurred five months after operation but unaccompanied by pain.

Cystoscopy showed bloody pus exuding from the right ureteral orifice; the left was normal. A diagnosis was made of probable tumor or hemorrhagic inflammatory condition, and a second operation decided upon. The ureter when exposed was so thick that it resembled a filled ascending colon; freed from adhesions it was found to be almost normal near the bladder, where it was cut and ligated. The patient recovered after four weeks. Microscopic examination of the removed ureteral specimen showed infiltration of the wall of the ureter by the tumor.

Grouping of cells around the blood-vessels allows of two different diagnostic interpretations—either papillomatous tumor or endothelioma. It would seem that papilloma was most likely the correct diagnosis as there is no connection between tumor and dilatation of the ureter.

Van Cappellen diagnosing the condition considers it a congenital stenosis of the ureter near the bladder; in later years inflammation developed in the gradually widening ureter and kidney, and in the inflamed ureter a carcinoma developed. Only 17 cases of ureteral carcinoma were found by the author in the literature and in most of these cases invasion of the surrounding tissues had already occurred.

W. A. BRENNAN.

BLADDER, URETHRA, AND PENIS

Moorhead, J. J., and E. L.: Ectrophy of Bladder; Report of Two Cases. *J. Am. M. Ass.*, 1916, lvi, 409.

Ectrophy of the bladder occurs once in about 20,000 births. In the proportion of one female to five males. The mortality during infancy is 60 per cent. This congenital defect is best explained on a mechanical basis—an intra-uterine rupture of a completely formed bladder.

Maydl's method in the first successful transplantation of the vesical trigon in the sigmoid colon in a

case of exstrophy of the bladder in 1891 was followed in 141 cases collected from the literature and in the two cases reported by the authors.

The first case, a man, aged 36 years, whose family history was negative, had had no illness since childhood and always lived on a farm, doing the usual work. Surgical treatment of this patient during his earlier years, several times proposed to the parents, was rejected for various reasons. A continual tendency of late prompted the desire to seek relief.

A modified Maydl operation was performed in two stages. The post-operative course was satisfactory until the seventh day, when a sudden change was noticed. He complained of precordial pain, his facial expression was anxious, breathing difficult, pulse rapid and weak, temperature elevated. His condition became steadily worse and he died within a few hours.

A limited post-mortem revealed a circumscribed peritonitis in the region of the transplantation; there was no leak, the trigonal flap and the bowel wall were of good color, the ureters were normal; the kidneys were somewhat congested; there was no pus. Venous thrombosis was apparent in the region examined.

The second case, a woman, aged 26 years, was the only member of her family to have a congenital deformity. She had borne two children; one was living, aged 4 years, the other died when 4 months old. While her condition was pitiable before she became a mother, childbearing, followed by prolapse of the uterus and vagina, added much to her woe.

At the first operation the cervix was amputated and the pelvic floor repaired. Recovery was satisfactory.

At the second operation (three weeks later), catheters were inserted in the ureters. The exstrophied bladder was dissected subperitoneally to the requisite extent and wrapped in gauze. The peritoneal cavity was opened. The uterus was amputated at the cervicocervical junction. The ovaries and tubes were preserved. The ligaments were used in the best possible manner to anchor the stump. The sigmoid colon was delivered and an intestinal clamp applied. The bowel was incised in the long axis 3.5 cm. The bladder was brought in apposition with the colon; no tension. Anastomosis and closure of the wound were made. The anal sphincter was dilated and a rectal tube inserted. The patient left the hospital in five weeks, pleased with her condition. Urine was now retained four hours during the day and caused little discomfort at night. Subsequent observation indicates a good functional result.

EDWARD L. CORNELL.

GENITAL ORGANS

Catton, J. H.: Leucopenia: Its Relation to Orchitis. *Calif. St. J. Med.*, 1916, xiv, 51.

The author shows that the blood picture in the various infectious diseases in which orchitis occurs

as a complication are strikingly similar. In some of the diseases, namely, scarlet fever, tonsillitis, pneumonia, and septicæmia, orchitis occurs in the virulent type of the disease only, where the blood picture shows a leucopenia. The conclusions are as follows:

1. Hamatogenous infection of the testes may occur in mumps, typhoid, malaria, influenza, Malta fever, typhus, filariasis, syphilis, tuberculosis, leprosy, and smallpox; and less frequently in scarlet fever, tonsillitis, pneumonia, and septicæmia.

2. A reduction, absolute or relative, in the number of granular leucocytes is characteristic of the above infections with the exception of scarlet fever, tonsillitis, pneumonia, and septicæmia.

3. A reduction, absolute or relative, in the number of granular leucocytes does not occur under certain conditions in scarlet fever, tonsillitis, pneumonia, and septicæmia.

4. Even in the absence of a history of orchitis there may be a relation between testicular affection and leucopenia in the case reported.

After a careful consideration of the etiology of orchitis; a study of the leucocyte pictures in the infections reaching the testes through the blood stream; and the observance of testicular affection in a case with a history of infections belonging almost exclusively to the group under consideration, and at the same time exhibiting a leucopenia, the suggestion is offered that there is a definite relation between testicular affection on the one hand and a disturbance in the normal relation between the number of granular to the number of hyaline leucocytes; i.e., a tendency toward decrease in the number of granular cells and an increase in the number of hyaline cells.

V. D. LIPSON, MD.

Outland, J. H., and Glendening, L.: Enormous Abdominal Cyst, Probably Due to a Retained Testis. *Surg. Gynec. & Obst.*, 1916, xiv, 294.

The authors refer to the previous studies of Osler and Bulkley, who have called attention to the occurrence of abdominal tumors, diagnostically puzzling, which were in fact, degenerations (usually in the form of sarcomata) of undescended testes either in the inguinal canal or in the abdomen.

The case reported was that of a man of 65 who had had an abdominal tumor for 15 years. It had grown rather rapidly in the six months before operation and filled the left upper portion of the abdomen. Laparotomy revealed an enormous cyst filled with coffee-colored liquid. Its removal was impossible and the patient died in shock six hours after the emptying of the fluid. At autopsy the important findings were the intimate attachment of the cyst walls to the left kidney and the absence of the left testis.

Willard, W. P.: Report of Cases of Malignant Testicle. *Calif. St. J. Med.*, 1916, xiv, 134.

Willard presented the histories and microscopical findings of three cases of cancer of the testicle, with

the idea of showing the different courses taken by these cases after operation, and also reports the ideas and statistics of the various operators as to what is considered the proper treatment to pursue.

He claims the classification of these tumors is still open to debate, but the classification of Chevassu would be of some assistance; he also claims that the prognosis is not good.

His first case was operated upon about two months after the appearance of the tumor and the lumbar glands were involved within five months; the second case was operated upon six months after the appearance of the tumor and there was a local recurrence 18 months later; the third case was operated upon 21 months after the appearance of the tumor and was well four months later.

The author claims that the treatment of this condition is surgical and the necessity of removing the cord with the testicle is important. If the tumor has involved the scrotum, the cord as high as the inguinal ring, or the inguinal glands it will have invaded in all probability the lumbar lymphatic glands and their removal must be considered.

LOUIS GROSS.

Campiche, P. S.: Peculiar Inflammations of the Iliac Fossa, Following Simple Epididymitis; the Anatomy of the Lymphatics. *Surg. Gynec. & Obst.*, 1916, xii, 140.

The author describes two cases of inflammations of the iliac fossa. In the first a large iliac abscess came after a simple tubercular epididymitis. In the second case a nodular inflammatory swelling high in the iliac fossa followed a simple gonorrheal epididymitis. In neither instance was the scrotum involved.

Although many authorities in anatomy, even in very recent works, state that the lymphatics of the testicle and epididymis all go to lumbar lymph-nodes, the author points out that several writers—among them Cunéo, Testut and Jakob, Spalteholz, Gross, and others, following Zeissl and Horowitz—now admit that a part of the lymphatics of the testicle do not go to the lumbar lymph-nodes, but go to some lymph-glands lying in the iliac fossa, below the crossing of the ureter.

The two clinical observations reported by the author confirm this view, and surgeons should remember it in the differential diagnosis of inflammations of the iliac fossa.

Ashcraft, L. T.: The Surgery of the Vas Deferens. *N. Eng. M. Gaz.*, 1916, li, 19.

The author enumerates the following conditions that may be benefited or cured through surgery of the vas deferens: seminal vesiculitis, epididymitis, diseases of the ejaculatory ducts and, in some instances, posterior urethritis. The majority of these are rebellious to therapeutic and mechanical measures and, unless treated surgically, become chronic. A simple vasostomy, he believes, will do much to relieve and often cure general systemic

conditions depending upon a focal infection. A longitudinal incision into the vas opens the canal, and its patency is tested by injecting a solution of carbolfuchsin or any non-irritating coloring matter. This fluid will distend the seminal vesicle, which subsequently discharges it into the bladder. A solution of 5 per cent argyrol or 1 per cent protargol may afterwards be injected. The amount used at the first injection varies from 4 to 8 cc. Ashcraft rarely gives more than three injections, because of the resulting lumbicollitis.

Vasostomy also relieves pressure upon the epididymis. This operation has likewise been suggested for tuberculosis by Rowing, who injects the seminal vesicle every day or so with a 5 per cent solution of phenol, but Ashcraft thinks that in such circumstances it might be as well to excise the seminal vesicle, vas, and epididymis.

In acute cases of seminal vesiculitis it is not necessary to resort to injections, a simple vasostomy usually being all that is needed to relieve the pressure from the epididymis and drain the vas. Both vasa may be drained at one sitting. When the condition becomes chronic, injection of the seminal vesicles through the vas should be tried before resorting to more radical surgery. During the past few years, Ashcraft has been employing this procedure of vasostomy and injection of the seminal vesicles (Belfield's operation) in rebellious cases of seminal vesiculitis in which there were no adhesions and of so-called gonorrheal rheumatism, with remarkably good results. The procedure is unattended by any danger, and is not followed by stricture of the vas deferens or the absence of spermatozoa. For colon-bacillus infections of the seminal vesicles, when a systemic toxæmia results, the same beneficial effects accrue.

In regard to epididymitis, the author is of the opinion that while medicine and mechanical treatment may alleviate it, they never effect a cure. His results following surgical treatment by means of combined vasostomy and epididymostomy, however, have been uniformly gratifying. The scrotum is incised, and a second incision is made in the tunica vaginalis, delivering the testicle. If the epididymis is swollen, especially at the tail, it should be punctured deeply in several places, gentle pressure being afterwards made to cause the exudation of the pus. Inasmuch as 15 per cent of the cases of acute gonorrheal epididymitis are complicated with acute seminal vesiculitis, the vasostomy incision should also be made. After returning the parts to position and suturing, drainage is inserted. It is remarkable how soon after this procedure the constitutional symptoms disappear. The discharge ceases in many instances. Although the scrotum may attain a considerable size after the operation, this swelling is not painful. In nearly every case, on examining the semen expressed from the previously diseased side several months subsequent to the surgical interference, active spermatozoa are found.

Slight reference is made by the author to the operation of vasectomy, as legalized in seven states for the sterilization of criminals and delinquents. The vas is simply divided, the ends ligated, and the wound closed. He is inclined to favor as a substitute the operation suggested by Belfield, vasoligation. This prevents discharges from coming from the epididymis so long as the ligature remains in place, the function of the testis returning when the ligature is removed.

Ascraft also mentions the operation of epididymo-vasostomy for sterility, for which medicinal measures are valueless, and states that the results obtained establish the fact that an anastomosis can be made between the vas and the epididymis, allowing exit to the fertile spermatozoa coming from the upper part of the epididymis. This operation, suggested by Edward Martin of Philadelphia, was first tried upon a human being in 1901.

Tourneau, J. P.: The Radical Cure of Hydrocele by the Inguinal Route (*La cure radicale de l'hydrocele vaginale par la voie inguinale*). *Prog. med.*, 1918, p. 25.

The author calls attention to the advantages which the method first suggested by Gomois and Phocas in 1909 has over other procedures for the radical cure of hydrocele. This method is the approach by the inguinal route. The technique consists of an inguinal or inguinopubic incision 2 to 4 cm. long. The subcutaneous cellular tissue is dug out and then, by pressure on the scrotum, the tunica vaginalis appears between the lips of the wound. Placing two forceps on the wall, the contents of the vaginal sac are evacuated through an incision. The testicle and its envelopes are then drawn through the wound and dealt with according to the state of the serous, which may necessitate a partial resection of the parietal fold. The testicle is replaced in its natural cavity and the wound sutured.

A. Goss.

Hyzer, H.: Seminal Colliculitis. *Hahneman. Monat.*, 1915, II, 22.

The anatomy of the verumontanum has only lately been demonstrated by the advent of the cystoscope and the observations of Rytina. Embryologically, it is developed from the united lower ends of the muellerian ducts. The organ is composed of a central glandular and a peripheral stroma portion. Pathologically, the colliculus may show simple congestion of its mucosa or marked distention so as to entirely fill up the lumen of the urethra, or multiple cysts and minute ulcerated areas with pus exuding from the opening may be seen. In chronic cases the only lesions may be a firm and hypertrophied colliculus. Etiologically there are two types, infective and non-infective. In the infective type the gonococci invading the veru have their origin in the prostate and seminal vesicles and in the other cases the colliculitis is caused by a pyelitis of colon bacillus origin. The non-infective or chronic type offers many etiological factors, chief

among which are (1) coitus interruptus, (2) masturbation, (3) ungratified sexual desire, (4) new-growths, such as hypertrophy, malformations, and projections.

Symptoms may be either urinary, sexual, or referred. Of the urinary symptoms the most important is urinary frequency by day and by night. This is followed by another well-defined symptom, terminal burning referred to the end of the penis or perineum lasting a few minutes with relief in the interval. The urine is clear in many cases with mucus floating on the surface. In the infective type it may be clear or cloudy with pus, shreds, and bacteria. Hematuria usually accompanies the acute colliculitis. Nocturnal enuresis is sometimes present. The sexual element associated with colliculus presents a picture which is usually common in both types, but especially in the non-infective. Nocturnal enuresis is frequent. Painful ejaculation followed by marked burning in the prostatic urethra for some hours leads to the unfortunate condition of sexual impotency. Of the referred symptoms sharp, severe, and intermittent pain in the lumbar region is quite common and suprapubic distress of a dull, heavy, aching character often referred to the testicle and rectum.

The diagnosis is made upon the clinical history and verified by the urethroscopic findings, but inflammatory conditions at the neck of the bladder, of the prostatic urethra aside from a colliculitis and prostatic bar should be ruled out. Undue sensitiveness and bleeding to instrumentation should arouse suspicion of colliculitis. Treatment depends on the etiology. In the infective type when the focus is in the prostate or vesicles it is useless to direct treatment to the caput even if the urethroscopic picture shows evidence of inflammation. In the non-infective type due care and precaution must be exercised owing to the predominant neurotic element. Hygienic and suppurative measures should not be neglected. Divulsion of a tight sphincter and does wonders. Dilatation of the posterior urethra with a Kollman dilator and topical applications to the caput of silver nitrate, iodine, and copper sulphate solutions are productive of good results. In long-standing cases when there is a hard fibrous caput which through repeated cauterization has left a hard cherry-stone-like elevation which defies all effort at alleviation, the operation of colliculotomy has been resorted to with marvelous and very gratifying results.

C. R. O'Connor.

Schmidt, L. E.: Vesiculotomy and Vesiculectomy. *J. Am. Med. Ass.*, 1916, LVII, 157.

The chief credit for calling the attention of surgeons to the operative treatment of these organs is due to Fuller and Belfield. Insufficient knowledge of the minute anatomy and pathology, as well as the obscure location, is probably responsible, rather than the technical difficulty of the operation, for these organs having received so little attention in the past.

In the etiology, the infecting organisms in order of frequency are staphylococcus, streptococcus and colon bacilli, which presumably are secondary to infections with the gonococcus. This infection in some cases may become extinct but in chronic cases is presumably present. Further light, however, is needed upon toxic cases with or without involvement of the joints, where smears, cultures, and the complement-fixation test are all negative. Results of operations in such cases may be disappointing.

The author accepts Belfield's classification of the symptomatology, and gives a résumé of each of the five groups: (1) Symptoms referable to the genital organs, (2) to the urinary organs, (3) to the rectum, (4) to the abdomen, (5) systemic. Secondary nervous or mental symptoms must also be included. In the treatment of these diseases, the author considers them according to the different types. He emphasizes that in all cases minor procedures should be thoroughly tried, except in acute cases with grave symptoms where drainage should be resorted to. Rectal puncture is not justifiable.

One should be very conservative where nervous or mental symptoms are present, and in the milder cases vasotomy may be the preferable operation before resorting to the most radical methods.

In reviewing the anatomy of the vesicles, Schmidt calls attention to the fact that in some of the textbooks the position of the ureter in relation to the ampullæ and the vesicles is frequently shown incorrectly.

He favors the perineal route of approach and describes his method of operating, which is practically that of Squier and Young. The indications for choice between incision and removal of the vesicles are also given.

HORACE BINNEY.

Culver, H. B.: A Study of the Bacteriology of Chronic Prostatitis and Spermatocystitis, with Special Reference to Their Relationship to Arthritis. *J. Am. M. Ass.*, 1916, lvi, 333.

After a careful review of the literature on the bacteriology of chronic prostatitis and spermatocystitis, the author describes his own technique, employed in the study of the prostatic and seminal vesicle contents of 34 patients, 26 of whom were suffering from subacute or chronic arthritis.

Briefly stated the results of the author's investigations are as follows: anaerobic as well as aerobic organisms may be the existing cause of chronic prostatitis and spermatocystitis. These organisms seem to be specific for the infected individual, as proved in 66 per cent of Culver's patients tested, in which positive reactions were obtained after injection of the autogenous organisms.

On repeated examinations many cases of prostatitis and spermatocystitis reveal the infecting organism which seemed to be non-infectious upon a single examination. Specific local reactions point to the relationship of chronic infections of the prostate and seminal vesicles with a subacute or

chronic arthritis. Drainage of the focus of infection by massage or otherwise, together with the raising of the antibody content of the patient's blood by inoculation of killed organisms, constitute the most advantageous and rational treatment of these conditions.

M. KATHMAYER.

Stokes, A. C.: Operations by Local Anesthesia on the External Genitalia and Prostate. *Canad. J. Urol. Res.*, 1916, vi, 92.

The author sums up ten years' work in performing operations by local infiltration anesthesia as follows:

1. Experience shows that to do these operations successfully without pain to the patient, the operator must have thorough command of himself and be in a position to meet every emergency of the operation without irritation or disturbance of the equilibrium of the operation room. The progress of the operation must be without a break in technique.

2. The cutting instruments used must be very sharp and incisions made, not tearing or dragging on the tissues. Little or no pain is produced by cutting, but patients cannot tolerate pulling or dragging on the tissues. Artery clamps must not be pulled, retractors must be handled with the utmost care and dissections must not be made until the operator is certain that the field of dissection is thoroughly infiltrated, and then with cutting instruments only.

3. The patient must be assured that any time that he feels pain the operator will stop at his request. A tactful nurse or house officer must sit at the head of the patient and engage him in conversation as much as possible during the entire time of the operation. The patient must be assured that he will not be harmed and that no pain will intervene. The eyes should be covered, because to some people the sight of blood produces a bad temporary reaction. The author's records show that during the last ten years the following operations were done by local anesthesia: inguinal hernia, 34 cases; hydrocele, 19 cases; varicocele, 32 cases; prostatectomy, 3 cases; amputation of the penis and removal of the inguinal glands, 1 case; hemorrhoids, 5 cases; suprapubic cystotomy, for one cause or another, 7 cases.

H. A. MOORE.

MISCELLANEOUS

Warden, C. C., and Schmidt, L. E.: Gonococcus Complement Fixation; a New Lipoid Antigen. *J. Lab. & Clin. Med.*, 1916, i, 333.

The author presents in detail the conclusions summarized in a preliminary report on the use of the fats of the gonococcus as antigens in gonococcus complement-fixation tests in which the superiority of an alcoholic solution of these fats over watery extracts was shown.

In all the tests a commercial antigen was used parallel with the Warden antigen. The latter was prepared in such a manner that each 1 ccm. of absolute alcohol contained in solution 0.001 gram. of gonococcus fats as fatty acids. To this was

added one-third volume of a one per cent alcoholic solution of cholesterol.

The sheep-rabbit hemolytic system in which the serum was active in dilutions of 1:10000 with fresh guinea-pig complement and three washed sheep cells was used. The titre of the antigens and hemolytic serum was made frequently in the usual manner. The commercial antigen was used in the maximum quantity, permitting complete hemolysis in a given time and the Warden antigen in one-half the lowest inhibiting dose. When set up the tubes contained, in addition to the antigens, one drop (0.05 ccm.) of the patient's serum, one drop of complement, and sufficient salt solution to equal 1 ccm. After the first incubation of one hour there were added to each tube ten drops (0.2 ccm.) of a 5 per cent suspension of sheep cells, and an equal quantity of diluted hemolytic serum, representing two units of hemolysin; that is, twice the quantity sufficient to produce complete hemolysis in thirty minutes. The tests were invariably controlled by known positive and negative sera, and separate tubes used for each ingredient.

Particular caution was used in the titration of the commercial antigen as it was observed that individual samples varied with time, and that different lots varied widely in anticomplementary power, although bearing the same unit quantity on the labels. The alcoholic antigen has not varied perceptibly in six months.

The tables show the outcome of 423 tests upon the sera of 365 persons. The list includes tests upon the sera of 50 normal individuals of all ages, with negative results in all.

Also one hundred cases of disease other than gonorrhea, in which a certain proportion of positive reactions was obtained, and in which evidence of gonorrhea could not be eliminated, a fact which speaks for the value of the test.

Particular attention was paid to luetic sera, but without detracting from the specificity of the gonococcus antigen.

Table No. 1 — diseases other than gonorrhea — shows that the commercial antigen gave positive reactions in 5.4 per cent of cases; and the Warden antigen in 13.6 per cent.

Table No. 2 — acute gonorrhea — shows that the sera of the acute cases reacted with commercial antigen in 40 per cent. The earliest reaction appeared on the fourth day, and three cases reacted within the first week. The Warden antigen gave

positive reaction in 72 per cent of these cases. Three occurred on the second day of the injection and eight within the first week.

Table 3 — subacute cases of gonorrhea — shows that 23 per cent reacted to the commercial antigen and 64 per cent to the Warden antigen.

Table 4 — chronic gonorrhea — shows that of 35 cases examined 17 per cent gave positive reactions with commercial antigen and 48 per cent with the Warden antigen.

Table 5 — long-standing and repeated attacks of gonorrhea — shows that of 80 sera 34 per cent gave positive reactions with commercial antigen and 50 per cent with the Warden antigen.

Table 6 — gonorrhea in female children — shows that in 33 cases positive reactions to commercial antigen were given in less than 10 per cent and to the Warden antigen in 54 per cent.

Table 7 shows the number of positive reactions obtained with both antigens in cases where gonococci were demonstrable. Also the number of positive reactions where gonococci were not found.

Comparison of the two antigens shows the superiority of the Warden antigen over the best watery antigens. Where the latter gave positive reactions, the former invariably gave positives, and, as a rule, to a greater degree. With the latter also there was less fluctuation. The positive reactions appeared earlier, persisted longer, and occurred in a larger number of doubtful cases. The authors believe this antigen can be still further improved.

The conclusions are as follows:

1. An alcoholic solution of the flocs of the gonococcus serves as an antigen in the gonococcus complement-fixation test and is superior for the purpose to the watery antigens of commerce.

2. The authors concur in the opinion that positive reactions are always of value. Repeated negative reactions in the absence of clinical signs are of great value. A single negative reaction has no significance whatever.

3. While the sera of normal persons have been thus far wholly negative, and while it is admitted that positive reactions are largely confined to cases where the gonococcus is, or has recently been present, nevertheless, the evidence, as a whole, leads to the belief that a positive reaction indicates the presence in the serum of some substance which reacts with the antigen to produce fixation of complement and not necessarily the presence of a focus of gonococcus in the body.

H. G. BROWN

SURGERY OF THE EYE AND EAR

EYE

Vail, D. T.: Management of the Eyelids During the Cataract Operation. *Lancet Clin.*, 1916, cvv, 159.

Uniformly successful cataract extraction demands a method of lid control that will require little or no help from the patient.

The orbicularis palpebrarum exerts but little pressure when acting alone. The corrugator supercilii and the muscles of the cheek and the side of the nose are important aids. It is essential then that any form of retractors to be effective shall be able to overcome the action of all these muscles. Vail describes his new type of lid retractors which while effective do not require the services of a specially trained assistant.

W. REEDER.

EAR

Palmer, D. H.: Cauliflower Ear. *J. Am. M. Ass.*, 1916, lxxi, 422.

The treatment used by the author is as follows: After preparing the skin surfaces of the ear, the meatus, and immediate vicinity of the face and scalp after any of the approved surgical methods, except iodine, which causes intense itching, and plugging the external meatus with cotton, an incision is made under local anesthesia slightly below the prominent part of the swelling through the skin and perichondrium into the hemorrhagic cavity. All clots, newly formed cartilage or bone should be removed with a small gouge or curette, the surface of both cartilage and perichondrium being scraped until smooth.

The incision is then closed, except for a small opening which will just admit the end of a eustachian catheter, connected through a waste bottle with a small Pyncheon pump. This rapidly removes the accumulated blood and the suction approximates the loose layer of skin and perichondrium to the cartilage.

The skin surface is then thoroughly dried and a fresh plug of cotton is placed in the external auditory canal. A generous coating of sterile petrolatum is applied over both surfaces of the ear and the adjacent skin of the face and scalp. Should there be any area in which the skin and perichondrium are not perfectly approximated, a small mold is made of dentist's modeling wax or sheet lead and pressure applied at that point. The mold, coated with petrolatum, is placed about the ear and half a tumblerful of plaster-of-Paris cream is poured into the mold, completely surrounding the ear. Thus the ear is completely encased in the plaster, with the

eustachian catheter still inside the wound and the pump working continuously. As the plaster hardens, a slight rotary motion of the catheter permits of its easy withdrawal through the cast and establishes a permanent drain to the wound for the escape of any newly-formed fluid. A small piece of gauze over the cast and an adhesive dressing to prevent all motion complete the operation.

The cast is removed by fragmentation ten days following the operation, when the ear will be found in exactly the same condition as at the time of the operation and will require no further attention.

In the old organized cases, the author makes a mold carved from plaster-of-Paris to represent the normal ear and with dentist's modeling wax makes a die. After removal of the foreign substance, and while the ear is perfectly soft and pliable, he forces the die down on the anterior surface of the ear and then encases the whole in plaster of Paris.

EDWARD L. CORNELL.

Brown, R. H.: The Chronic Running Ear. *Illnesses M. J.*, 1916, xxix, 95.

The author alludes to the following points:

1. Persistence of discharge from an ear treated by lacing and dry-wick drainage is due either to continued infection and poor ventilation through the eustachian tube, or to continued infection from a discharge from the mastoid cells and the attic.

2. X-ray examination will establish the diagnosis. Early operation on the throat or the mastoid, or both, with proper after-treatment, will effect a cure in the vast majority of cases. Ordinary washing and treatment with antiseptics in the canal is of itself of very little use.

3. Many patients will make light of efforts made in their behalf. They must first be educated. People really value acuteness of hearing highly. Danger to life is by no means slight in mastoid infections. Early operative treatment of this "appendicitis of the brain" is just as urgently required as in appendicitis of the abdomen.

OTTO M. ROTH.

Schiller, A. N.: Discharging Mastoid Sinuses. *N. Y. M. J.*, 1915, cxi, 121.

The author reports two cases illustrating his method of curing discharging mastoid sinuses by closure of the eustachian tube.

The technique is as follows: Using a one-ounce syringe with an inch long soft rubber tip fitted tightly into the external auditory canal, one ounce of a 10 per cent solution of argyrol is injected through the eustachian tube into the nasopharynx every second day for two or three weeks. Alcohol in-

jections are then used every second day, beginning with a 25 per cent solution, gradually increasing until 95 per cent strength is used. This clears up the catarrhal condition of the nasopharynx and the eustachian tube is then curetted with a small ring curette.

The author reports a case of a man who had a radical mastoid six months after scarlet fever without relief from discharge. Thirteen years later the author was consulted, and after removing adenoids he treated the eustachian tube and nasopharynx and curetted the eustachian tube with cure of the otorrhea.

Another case had discharge for thirteen years following radical mastoid after scarlet fever and it was treated the same way with cure.

ELLEN J. PATTERSON

Boyd, F. D.: The Method and Value of a Blood-Clot in a Mastoid Operation. *South M. J.*, 1916, ix, 179.

The author is enthusiastic over the blood-clot method and reports 5 cases so treated with success. The points in favor of this method are:

1. The blood-clot itself has been proved to possess a decided bactericidal property, and this is depended upon to counteract any germs left in the wound, and to prevent any infection.

2. In surgical diseases and injuries of the long bones, the use of the blood-clot has provided a reticulum or scaffolding upon which new tissues have solidified; the clot then becomes quickly organized and is finally converted into permanent osseous tissue. The cavity resulting from mastoid operation is regarded as providing a favorable field for this conservative process.

3. In actual experience a large proportion of cases operated upon by this method have been successful in the author's hands.

4. The blood-clot method saves much pain and discomfort, and in the case of wage-earners, the loss of time from work is only a small fraction as compared with the post-operative period of the old method.

OTTO M. ROLL

Marriage, H. J.: Skin-grafting in Mastoid Operations. *Practitioner, Lond.*, 1916, cvvi, 174.

For skin-grafting in chronic mastoid disease the author claims the following advantages:

1. The cavity heals much more quickly than by any other method.

2. Contraction and stenosis of the cavity are prevented; as well as pocketing of pus under exuberant granulations.

3. The treatment is less painful than plugging of the raw cavity.

4. The patient and surgeon are saved much time and trouble in after-treatment and the patient is able to get back to work earlier.

5. Complicated mental flaps and the deformity of the osseous which may result are avoided.

6. In a large proportion of cases the eustachian tube is closed, and reinfection by way of the tube is thus prevented.

For about eight years the author has employed the method of primary skin-grafting, i.e., the application of the graft at the time of the original operation. He believes that it saves the patient seven to ten days in convalescence, and it does away with the necessity for a second anesthetic, which patients dread and which may have a deleterious effect upon the general health.

His technique is as follows: After the ordinary radical mastoid operation, in which every trace of the disease so far as possible is removed and the dura of the middle fossa and lateral sinus is exposed, a mental flap is cut, and the posterior bony mental wall resected. The tympanum is then scraped out and the whole of the mucous membrane is removed, except the very small margin around the stapes, after which the opening of the eustachian tube is curetted with a small sharp spoon. To disinfect the cavity and check bleeding, hydrogen dioxide is poured in, left for two or three minutes, and then syringed out with normal saline at 105° F. This is done three times. The cavity is immediately plugged with gauze, and this plug is removed only when the graft is ready to be applied.

After the skin has been cleaned with soap and water and then well rubbed with a sponge soaked in ether, the author removes a thin Thierich graft, three inches long by two inches wide, from the patient's thigh, using a large, hollow ground razor, with the skin held on the stretch. The graft is carried to the ear on a section lifter, and is then sucked into place by means of a glass pipette, so as to line the whole cavity accurately. The graft is kept in place by the immediate insertion of a long strip of one-half inch aristol gauze tape. The end of the gauze is passed through the meatus, and the free end of the graft which is lining the posterior part of the cavity is folded over the plug and also brought out through the meatus. After tying the vessels which have been caught by hemostats during the operation, the skin opening is sutured so as to draw the ear back into its normal position.

On the fourth day the plug is withdrawn and the cavity syringed out with weak hydrogen dioxide, and a small piece of gauze tape is again lightly inserted. This process is repeated daily for a week, when plugging is discontinued and hydrogen dioxide is simply dropped into the cavity twice a day. The patient is seen at weekly intervals, at which time exuberant granulations may be counteracted or scraped.

The author kept a record of the first 10 cases in which he employed this technique. He got final data in 43, 34 of which were healed in less than two and one-half months. The hearing was ameliorated in 74 per cent, unchanged in 3 per cent, and impaired in 20 per cent.

ALBERT BRENTEN

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Smith, E. A.: Roentgen Ray Diagnosis in Diseases of the Accessory Sinuses. *War. M. J.* 1916, xiv, 387.

Skiagraphy in conjunction with other methods of diagnosis is of undoubted value in cases of inflammation and suppuration of the nasal sinuses, especially in disease of the frontal and ethmoidal sinuses, as it shows the size, extent, and relation of the sinuses and thus enables the operator to determine which operation to perform in a case of diseased frontal sinus or ethmoidal cells.

A skiagram is not of so much anatomical assistance prior to operations upon the maxillary and sphenoidal sinuses though it is of service in ascertaining the size of dental cysts in the maxillary sinus, polypoid or malignant growths, also foreign bodies or cannulae passed into the sinuses for therapeutic purposes. It does not indicate the exact nature of the pathological contents of a sinus or the degree of inflammatory change which has taken place in the mucous membrane, but it is of service in determining the effect of treatment upon the inflammatory affections of the accessory sinuses.

ELLEN J. PATTERSON.

Mahu, G.: Practical Notes on Local Anæsthesia in Otorhinology (Notes pratiques sur l'anesthésie locale en otorhinologie). *Ann. d. mal. de l'oreille, du larynx, etc.*, Par., 1915, xl, 845.

Operations performed under a local anæsthetic should not be considered synonymous with vivisection. Anæsthesia of soft parts is easy; of bones, more difficult. In operations on the frontal and maxillary sinuses or the mastoid it is necessary to anesthetize not only the superficial parts, but also the bony parts, internally as well as externally, the trephining of these cavities being followed, commonly, by curettage.

Experience proves that to obtain such result it is necessary that the injection be pushed into the external periosteal layer. All the accessible parts of the periosteal surface should be reached with the needle in order to obtain a more perfect anæsthesia.

As to the operative technique, the author makes the following recommendations: (1) a good syringe should be used; (2) a standard solution should be injected; (3) sufficient time should be taken to secure perfect anæsthesia. The author prefers to use syringes containing 2 ccm., similar to those used by dentists. For injections tangential to the bone, he recommends instead of curved needles, flexible steel needles, 2 cm. long. The solution commonly used in one ampoule is composed of: physiologic serum

(sterilized), 10 gr.; novocaine, 0.10 gr.; adrenalin solution, 1/1000 X gr. The contents of two ampoules suffice to anesthetize a sinus or a mastoid. Twice as much may safely be used.

The author describes the procedure in anesthetizing the maxillary sinus: A cotton tampon soaked with cocaine solution (1/20) is placed in the nose (lower and middle meatuses) and left for 5 minutes; another is placed in the canine fossa and a third on the internal surface of the gums of the premolars. The novocaine solution is injected as follows: (1) one or two syringes in the soft parts, in view of the gingival incision; (2) two or three syringes in the canine fossa and in a fanlike direction, all over the external wall of the sinus, the point of the needle striking the bone; (3) 2 syringes pushed in the same manner in the wall of the palate; (4) a syringe in the inferior horn, and one or two others tangential to the bony sinus-nasal wall. After a quarter of an hour, without fear of pain to the patient, the operation may be begun and continued for nearly one hour; if necessary additional anæsthesia may be used. The author finds it necessary, sometimes, to administer a hypodermic injection of pantopon or morphine three-quarters of an hour before the local anæsthetic is introduced. RAOUL L. VIGAN.

Clay, J. D. F.: Congenital Occlusion of the Posterior Nares. *Hahnemann Month.*, 1916, 5, 127.

The case reported was that of a young female aged seventeen years. The history showed no deformities of the nose or throat in the parents, three sisters, and two brothers.

The patient had difficulty in breathing and nursing when a baby and could never breathe through her nose. Her hearing had always been dull and her progress in school was poor. She never had any sense of smell. The tonsils and adenoids had been removed four years previous.

Examination showed both nostrils filled with glairy mucus and mucosa of polypoid character. At a depth of two and three quarters inches a probe encountered a long obstruction, which by post-nasal examination was found to occlude the entire cavities about one-quarter inch anterior to the posterior choana.

The ear drums were retracted and dull, and functional tests showed a reduction in hearing due to a lesion in the conducting apparatus.

A trephine opening was made in the bone with a chisel and mallet and the opening enlarged with a curette. The bone was excoriated in situ. From time to time granulations were curetted away from the edges of the bony wound.

OTTO M. RORT.

Bailey, H.: Deviations of the Septum. *J. M. St. M. Ass.*, 1916, vol. 29.

The etiological factors mentioned are: (1) trauma; (2) inability of the septum to adapt itself to pathological conditions since it is fixed between the unyielding frontal, ethmoid, and sphenoid bones above, and the superior maxillary and palate bones below. (If it grows more rapidly than its surroundings it must bend); (3) a high arch of the palate; (4) the rarefying of the air in an obstructed nostril.

As to the effects of the deviation there may be: (1) no symptoms whatever; (2) acute and chronic inflammations of the nose and accessory sinuses, of the middle ear, pharynx, and larynx, and mouth-breathing with the evils accompanying this condition; (3) hay fever; (4) headache and general malaise.

The following indications for operative interference are mentioned: (1) in cases of certain affections of the middle ear in which the use of the eustachian catheter is an essential part of the treatment; (2) as a preliminary to operations on the accessory sinuses; (3) as a preliminary to operations on the pituitary body; (4) where the septal bend impinges on the middle turbinate in such a manner as to interfere with the ventilation and drainage of the accessory sinuses; (5) where the deformity interferes with the normal respiration and drainage through the nose; (6) in cases of hay fever in which are located hypersensitive areas of contact between the convexity of the septum and the adjacent turbinate; (7) where the pressure of the septum against the nasal wall produces pain or headache.

For correcting deviated septum, Bailey gives preference to the submucous resection, after which he holds the flaps in position by means of interrupted silk sutures, using for the purpose a full curved needle one-half the size of the small-eye needle.

OTTO M. ROTT.

Moore, I.: The Histology of an Angiofibroma of the Nasopharynx and Its Important Bearing on Operative Procedure. *Proc. Roy. Soc. Med.*, 1916, 10, Laryngol. Sect., 27.

These growths are composed mainly of a dense white fibrous tissue, covered by an investing membrane sometimes comparatively thick but more frequently thinned away by the increasing pressure of the growth. Embedded in the fibrous tissue, especially in the central portion of the growth, are a large number of thin-walled blood vessels and large cavernous sinuses, devoid of a contractile coat; though in one section through the base of the growth the fibrous tissue is denser than elsewhere and the number of vessels is relatively smaller. This is of great importance from the operative point of view and is a guide to the position for attack.

The author thinks these tumors should be removed through the mouth by operating rapidly without losing time trying to stop hemorrhage which ceases spontaneously as soon as the growth and its attachments have been removed.

The author's technique is as follows: With the patient in the hanging head position the base of the growth is separated from the bone with sharp periosteal elevators working round and round as far as the choanal margin from behind forward and from side to side. Then with strong clamp forceps the main mass of the growth is seized and removed by evulsion, tearing with it the nasal and other prolongations which extend into the adjoining cavities.

ELLEN J. PATTERSON.

Mayer, E.: The Successful Intranasal Treatment of Affections More or Less Remote from That Organ. *Laryngoscope*, 1916, vol. 26.

The author reports the case of a male, 28 years of age, with a history of a fall, eight years previous, from the roof of a four-story building striking his head on a pavement followed by unconsciousness and a rapid increase in growth, especially of the hands and feet.

Two days before admission the patient had sudden abdominal cramps, vomiting, fever, and low unilateral headache, dull in character. He showed typical meningeal symptoms, and lumbar puncture gave clear fluid under high pressure. He had a blind left eye; right temporal hemianopsia; diminished left abdominal reflex and knee-jerk; weakness in the hands and the left side of the face; his tongue protruded to the left. The diagnosis was diseased process about the optic chiasm involving the entire left and decussating part of the right optic tract, the primary cause either in the ethmoidal cells or a pre-existing acromegaly, to be determined by X-ray.

Rhinoscopic examination showed a mucopurulent discharge in the right ethmoidal region and the condition was diagnosed as due to sphenoidal sinus obstruction. X-ray examination revealed a tumor in the hypophysis.

Under ether anesthesia the right middle turbinate and ethmoid cells and a portion of the left middle turbinate were freely removed so that a probe readily entered the sphenoidal sinus on the right. The patient promptly recovered and the diagnosis made was: acromegaly, acute basilar meningitis, paratyphoid fever, and ethmoidal abscess.

The author has permanently relieved from 50 to 75 per cent of cases of dysmenorrhoea by intranasal applications of trichloroacetic acid between menstrual periods.

ELLEN J. PATTERSON.

Carter, W. W.: The Correction of Nasal Deformities by Mechanical Replacement and by the Transplantation of Bone. *Surg. Gynec. & Obst.*, 1916, vol. 22.

Carter regards the framework as the basic, essential structure of the nose. This structure constitutes an arch which is built up of an indefinite number of segments so placed as to be self-supporting save at its two extremities. The displacement of one or more of these segments produces a deformity amenable to the bridge-splint operation, while the destruction of one or more of these segments

would suggest the transplantation of bone to correct it. The septum strengthens the nasal arch but does not support it. The upper edge of the septum, however, constitutes the keystone of the arch and its displacement means a depressed deformity. Great care should be exercised in doing the submucous operation not to disturb its position.

The bridge-splint applies the correcting force to the depressed nose in a direction diametrically opposed to the forces that produced it. This instrument was devised by Carter eight years ago and has been used by him successfully in a large number of cases including both recent and old depressed traumatic deformities.

The instrument consists of two fenestrated, curved steel wings hinged together in the middle. The edges of the wings are padded with rubber and the distance to which they can be separated is regulated by a thumb-screw. To be used in connection with this bridge are two intranasal splints which are molded out of sheet gutta-percha at the time of the operation and made to conform to the roof of the patient's nose. These are attached to silk sutures which are threaded into large curved needles. If the fracture is an old one the tissues are mobilized by means of several instruments of special design.

The application of the instrument is as follows: The needles bearing the sutures which are attached to the intranasal splints are passed from within the nose through the cartilaginous dorsum just below the ends of the nasal bones. The bridge is then placed over the nose and the sutures are passed through corresponding fenestræ in the bridge. The nasal bridge is then lifted to the desired height and the sutures are tied together across the hinge of the bridge. The bony side walls are then moved closer together by means of the adjustment screw, thus narrowing the base of the nasal triangle. The instrument should remain in position for two weeks.

The bridge-splint is used in those cases of nasal deformity where there remains a sufficient amount of bony tissue with which to reconstruct a normal nasal arch. Where there is a deficiency in this material resort must be made to bone-transplantation. This deficiency may be due to: (1) congenital defects; (2) traumatism, accidental or operative (submucous operation); (3) abscess of the septum; (4) destructive diseases such as syphilis, lupus, and atrophic rhinitis.

Two inches of the ninth rib is removed and split, the outer periosteum-covered half being used. Carter has recently advocated the use of a transplant composed of half cartilage and half bone taken from the end of the rib.

There are two routes by which the transplant may be introduced: (1) through an incision between the eyebrows; (2) from within the nasal cavity. Carter prefers the latter in the majority of cases as no external scar results. There is no additional risk of infection where the technique is properly carried out. Special instruments are used for the preparation of the field for the graft.

Carter's original work in bone-transplantation began seven years ago; his cases therefore are old enough to furnish conclusions, i.e.:

1. Bone with or without periosteum and free in the soft tissues of the nose is osteogenic and also acts in an osteo-inductive capacity.

2. Bare bone connected with live periosteum-covered bone is osteogenic and osteoconductive, the points of greatest growth being where it comes in contact with the bone and the periosteum.

3. A periosteum-covered transplant in contact with live periosteum-covered bone establishes a firm bony union with the latter in three weeks, and seems practically unaffected by its changed abode.

4. The transplantation of bone affords the best means for correcting nasal deformities resulting from a deficiency in the bony or cartilaginous framework of the nasal arch.

THROAT

Heitger, J. D.: Some Generally Unrecognized Points in the Anatomy of the Tonsils. *Laryngol. Clin.*, 1916, cxv, 163.

The importance assumed by the tonsil in the last decade demands a thorough knowledge of its anatomy, and a perusal of the average text book and handbook of anatomy shows that there are many gaps and much to be desired. He then considers in detail the blood supply of the tonsil and the lymph drainage through the tonsil from the nose, gums, and teeth. The embryology and anatomy of the folds or plicæ and the so-called capsule of the tonsil are discussed and mention is made of the effect of the position of the tongue and head upon the relations existing between the blood-vessels and the tonsils. Finally, the author refers to the practical importance of all these points (1) in the indication for removal of the tonsils, (2) in the technique of removal, (3) in the control of hæmorrhage, and (4) in the post-operative healing. OTTO M. ROTT.

Fetterolf, G.: The Larynx in One Hundred Cases Dying of Pulmonary Tuberculosis; a Clinical Post-Mortem Study. *Laryngoscope*, 1916, xxvi, 37.

The present report deals with the gross appearance of the following structures: epiglottis; aryteno-epiglottic folds; ventricular bands; vocal cords; arytenoid cartilages; interarytenoid space. The microscopic findings are left for a subsequent communication. Of the 100 cases, 83 showed gross tuberculous lesions, 11 showed absence of disease, and 6 were doubtful. The epiglottis was tuberculous in 36 cases, non-tuberculous in 37, and doubtful in 4. The type of lesion was as follows:

Infiltration	20
Infiltration with superficial ulceration	10
Infiltration with deep ulceration	4
Superficial ulceration	10
Deep ulceration	4
Tuberculoma	2

The aryteno-epiglottic folds were non-tuberculous in 42 cases and tuberculous in 38, with the following lesions:

Infiltration only	27
Infiltration with edema	22
Infiltration with superficial ulceration	7
Infiltration with superficial and deep ulceration	1
Deep ulceration	1

The ventricular bands were doubtful in 1 case, non-tuberculous in 37, and tuberculous in 42, as follows:

Infiltration	18
Infiltration with superficial ulceration	11
Superficial ulceration	7
Deep ulceration	6

The vocal cords were non-tuberculous in 51 cases and tuberculous in 49, as follows:

Infiltration	10
Infiltration with superficial ulceration	7
Infiltration with deep ulceration	6
Superficial ulceration	18
Superficial and deep ulceration	4
Deep ulceration	4

The arytenoid cartilages were non-tuberculous in 43 cases and tuberculous in 57, as follows:

Infiltration	44
Infiltration with superficial ulceration	8
Infiltration with deep ulceration	3
Deep ulceration	2

The interarytenoid space was non-tuberculous in 31 cases and tuberculous in 49, as follows:

Infiltration	47
Superficial ulceration	2

OTTO M. ROTT.

New, G. B.: Fibroepithelioma of the Larynx. *J. Am. M. Ass.*, 1916, lvi, 366.

The author reports the case of a woman who complained of hoarseness for the past 8 years. Examination of the larynx revealed a tumor in the left side, covered with normal looking membrane, apparently bulging the aryteno-epiglottic fold. The left cord was not visible and only the posterior third of the right cord could be seen. The tumor did not change its position during respiration. It was quite elastic and easily indented with a probe. Its apparent size was one inch in diameter. Thyroidectomy was performed and the mass shelled out.

The author reviews the literature of the subject — 23 cases in all. The youngest patient was a boy 9 years of age; the oldest, a man 80 years old.

OTTO M. ROTT.

Barwell, H.: Glottic Stenosis of the Larynx Treated by Intubation. *Lancet, Lond.*, 1916, i, 100, 462.

The author presents a case report and draws attention to the clamped tube devised by Rogers & Delavan of New York. This apparatus consists of a vulcanite intubation tube held in position by a clamp passed through the tracheostomy fistula. The clamp is made of white metal, is in two pieces for separate introduction like an obstetric forceps,

and has a plug which screws on over the shank to fix it. This procedure (1) prevents the danger of spontaneous extubation; (2) permits the patient to be treated at home inasmuch as extubation cannot occur spontaneously; (3) it keeps open a fistula in the neck so that a tracheostomy tube may be easily introduced should dyspnea follow removal of the tube.

OTTO M. ROTT.

Imperator, C. J.: Some Methods Useful in Direct Laryngoscopy. *N. Y. St. J. Med.*, 1916, xvi, 15.

The author discusses the subject of direct laryngoscopy by means of the various instruments as those of Jackson, Mosher, Lynch, Brunning, Hill, and Killian's suspension apparatus, and offers the following suggestions and warnings:

1. In children and especially in infants, if the examination is prolonged, there is marked danger of inducing an edema of the larynx.

2. Gagging invariably means that the operator is pressing the larynx forward with the beak of the instrument in the entrance of the esophagus.

3. The smaller the tube, the easier for the patient, but the larger ones are preferable to use while operating.

4. The spatula should be warmed before introduction.

5. Extra lights and batteries should be at hand.

6. Biting and cutting instruments should be introduced closed.

7. The use of rolled gauze or tampons for mopping and cleaning the field is advised.

8. The Brunning endoscope should be focused and the Jackson type of instruments should be brought to the proper degree of illumination before introduction.

The author operates under local anesthesia in the vast majority of cases, the method of application being to begin at the tip of the tongue and swab the lingual surface toward the pharynx. Then the pillars of the pharynx, soft palate, and tonsils are swabbed, then the epipharynx and posterior wall, then the vallecular, the laryngeal surface of the epiglottis, laryngopharynx, pyriform sinuses, arytenoids, and finally the vestibule of the larynx. Three to five applications of a 20 per cent cocaine solution are applied within 20 minutes, the last application being made to the epiglottis and the larynx.

The suspension method is described and the instruments and position of the patient in the other methods of direct laryngoscopy are discussed, as well as the advantage of these methods for such procedures as intubation, epiglottectomy, treatment of retropharyngeal abscess and abscess within the larynx.

The fox terrier is recommended as an ideal subject to use in the teaching and practice of direct laryngoscopy.

In conclusion the author dwells on the importance of repeated practice in order to perfect one's technique, or the more satisfactory picture presented by

the direct method, and on the great possibilities, both from a diagnostic and operative standpoint, which the direct method offers.

OTTO M. RORT.

Fraser, J. S.: Fatty Tumor of the Hypopharynx Obstructing the Larynx. *Edinb. M. J.*, 1916, xvi, 45.

Fraser reports the case of a man, aged 76, who had increasing hoarseness and dyspnoea over a period of two years. After eighteen months indirect laryngoscopy was performed with relief for a short time, but later the dyspnoea became so marked that the patient had to lie on the left side to breathe at night and had increasing dysphagia.

Laryngoscopy showed a large, lobulated, pedunculated, yellowish-pink tumor growing from the left lateral wall of the pharynx and the left aryteno-epiglottic fold. The growth was hanging down into the aperture of the larynx and was alternately sucked into and blown out of the larynx with inspiration and expiration. It was removed by suspension laryngoscopy, under local anaesthesia, with the cauterizing snare, and the patient discharged in ten days. Microscopic examination showed the growth to be a lipoma.

A careful search of the literature shows records of only five cases of lipoma of this region in patients whose ages varied from 13 to 71 years. The tumors sprang from the epiglottis, glosso-epiglottic fossa, base of the tongue, aryepiglottic fold, and pyriform sinus. An interesting observation was the slight symptoms produced by the large growths which must be completely removed or rapid recurrence occurs.

ELLEN J. PATTERSON.

Carpenter, E. W.: Report of Forty-six Cases of Intubation. *J. So. Cal. M. Ass.*, 1916, xii, 11.

Of the 46 cases intubated there were 11 deaths from the following causes: 1 from accident—the tube was coughed out; 1 was moribund and hopeless before intubation; 2 died from violent struggling before intubation; 2 died a few hours after intubation with hyperpyrexia; 1 died from cardiac failure; 2 died because of chronic disease; 2 died from neglect; careful nursing would have altered the result.

The advantages of intubation over tracheotomy are:

1. It can be rapidly performed.

2. It requires no anaesthetic.
3. The parents' consent is readily procured.
4. Respiration is continued through natural channels.
5. Dangers of aspiration pneumonia and infection are reduced to a minimum.
6. No after-treatment is necessary.
7. The pressure of a properly fitted hard rubber tube seldom causes ulceration and acts beneficially on the subglottic hyperplasia.

Among the indications are toneless and whispering voice with suppressed cough; urgent dyspnoea and the loud stridor of croup during both inspiration and expiration; when there is marked recession at the base of the sternum and above the clavicles; and particularly when the above symptoms cannot be relieved by emetics.

The disadvantages of intubation are: (1) the possibility of tracheotomy becoming necessary anyway; (2) forcing the membrane into the trachea; (3) the tube may become blocked, may be coughed out, or may slip into the trachea; (4) the tube may create a condition which demands its retention; viz., adductor spasm.

The complications which may arise are: (1) a pin-hole aperture through the cricoid region caused by swelling; (2) a detached membrane in the glottis or the subglottic area; (3) low tracheal membrane.

As to position, the author favors the prone position. In the 46 cases there were 16 in which more than one intubation was necessary—in one case as many as 6 intubations being required. As causative of this re-intubation are: (1) adductor spasm, (2) hyperplastic infiltration, (3) vasomotor paralysis due to the pressure of the tube.

The first extubation is done on the fourth or fifth day and the patient should be watched for an hour.

In the hands of an expert the author is satisfied that intubation in laryngeal diphtheria is by far the best operation.

OTTO M. RORT.

Cronin, J. J.: Thromboplastin (Tissue Extract) as a Haemostatic. *J. Am. M. Ass.*, 1916, lxxvi, 557.

Hess' thromboplastin was used in 2,036 adenoid and tonsil operations in the clinics of the Bureau of Child Hygiene of New York City. A summary of the results is as follows:

Questions	Results at Clinics				
	Pleasant Ave.	East 108th St.	Third Ave.	Lawrence St.	Herkimer St.
When did you begin its use	June 12, 1912	June 5, 1913	June, 1913	June 1, 1914	July, 1914
Number of cases in which thromboplastin was employed	387	261	150	408	313
Results as regards post-operative hemorrhage	No bleeding	No bleeding	Very little bleeding	Very slight bleeding	No bleeding
Do the children vomit blood as frequently	No	No	No	No	No
Do they have bloody stools as frequently	No	No	No	No	No
What is the general condition of the child?	Very good	Good	Good	Good	Nearly normal

Not in a single instance has the operator or nurse been compelled to return to the clinic to care for a bleeder after operation since the use of thromboplastin was made a routine procedure. In case a hemorrhage did occur, any trained nurse could apply the hemostatic while awaiting the arrival of the medical inspector. Although thromboplastin solution is used liberally in the throat, and no doubt some of it is swallowed, there has been no case of illness resulting.

Thromboplastin is safe, effective, and easily applied.

EDWARD L. CONNELL.

MOUTH

Alexander, G. J.: Radical Operation of the Maxillary Sinus Under Local Anesthesia; Report of Two Interesting Cases. *J. Ophth., Otol. & Laryngol.*, 1916, vol. 39.

The radical operation employed is the Denker operation. The technique of the administration of the anesthetic is as follows: After the application of a 20 per cent solution of cocaine to the gingival mucosa and to all the parts in the nose on the side to be operated on, infiltration anesthesia is begun by injecting 6 ccm. of a 2 per cent solution of novocaine into the soft tissues of the canine fossa and into the mucosa of the alveolar process, dividing the solution between four points, the first two under the periosteum of the alveolar process to get anesthesia of the bone, the third, close to the infra-orbital nerve, and the fourth into the soft tissues near the zygomatic process.

Going back to the nose, 3 ccm. of the novocaine solution is divided between three areas: the first is the posterior half of the inferior turbinate on its median surface; the second at the anterior end of the inferior turbinate; and the third on the floor of the nose under the periosteum in the fossa pyramidalis. To the total quantity of the novocaine solution used (8 ccm.) 4 or 5 drops of adrenalin are added. The operation is begun after an interval of 10 or 15 minutes. The anesthesia thus produced will last two to three hours.

After removing the anterior and lateral wall of the sinus, the cavity is packed with gauze containing a 20 per cent solution of cocaine with 4 or 5 drops of 1/1000 solution of adrenalin. This is left *in situ* for 10 or 15 minutes before proceeding with the operation. The only points where there is pain are around the infra-orbital nerve and along the posterior-superior portion of the nasal wall.

The author claims four distinct advantages for local anesthesia:

1. In such conditions as serious heart lesions, pulmonary tuberculosis, kidney lesions, etc., its administration is imperative.

2. A number of patients have an insurmountable dread of a general anesthesia and gladly accept the opportunity to have operative conditions corrected under local anesthesia that might otherwise go on to a serious termination.

3. The number of days in bed and confinement to the hospital, a week or ten days, that is usual with general anesthesia in hospital cases, is in many instances inconvenient to the business man or to the wage earner, to say nothing of the unpleasantly many have to confinement in the hospital.

4. The operation is more easily accomplished with the co-operation of the patient; in the natural position of the parts, as when in a sitting posture, hemorrhage is less difficult to control; better illumination can be maintained; better facilities for viewing more accurately all parts of the cavity during operative procedures, and all after-treatment can be done at the office.

OTTO M. RORT.

Skillern, R. H.: When Shall We Operate in Chronic Maxillary Sinusitis and What Form of Operation Shall We Choose? *J. Ophth., Otol. & Laryngol.*, 1916, vol. 39.

The following factors are taken into consideration in determining the indication for operative interference: (1) the general condition of the patient; (2) the history of the disease; (3) the probable pathological condition of the sinus mucosa and the osseous walls; (4) occupation, social condition, age, and sex; (5) retention, threatened orbital or cerebral complications.

1. As to the general condition of the patient, if he is severely affected; unable to follow his usual occupation; suffering from continuous or intermittent pain; head suffused and congested; sleep badly disturbed; profuse, purulent discharge from nose and posteriorly into the throat; intermittent fever and generally miserable, immediate evacuation by needle puncture is advised. If the patient is depressed and bordering on melancholia, a radical operation for cure is indicated instead of treatment.

2. If the history shows the disease to be of dental origin, an immediate operation is advised. If there is a history of recurrent attacks, a radical operation should be advised if a cure is to be expected but the decision is left to the patient. If a patient states that he has been troubled for several years with his nose, but only lately has the discharge been profuse and the headaches severe and persistent, the chances are that only a radical operation will result in a cure. However, conservative treatment may be tried first.

3. If permanent pathological changes in the form of polyps or polypoid hypertrophies are present, radical operation is indicated. Likewise is the radical procedure demanded if there is involvement of the bony walls.

4. As to occupation, masons, drivers, plumbers, and outside workers can carry a diseased antrum with less discomfort than a schoolteacher, a barber, or a hotel clerk, and consequently the radical operation, other things being equal, is more urgently indicated in the latter class of people than in the former. People with limited means and limited time had best be cured promptly by the radical operation. As to age, any form of purulent maxil-

lary sinusitis in the very young (6 months to 12 years) which shows a tendency to become chronic calls for immediate surgical intervention. In young adults the general system is usually vigorous and will respond quicker to conservative means than in older persons.

3. Where there is retention, threatened orbital or cerebral complications, a radical operation is imperative.

The selection of the form of operation depends upon: (1) the etiology of the disease; (2) the chronicity of the disease; (3) the tendency and course of the disease; (4) the age of the patient; (5) the social condition of the patient; and (6) the physical condition of the patient.

1. As to the etiology of the disease, mention is made of that type of dental origin in which the Cooper method is indicated.

2. As to chronicity of disease affecting the type of operation, it is stated that the greater the changes, the greater or more radical the operation.

3. As to the tendency and course of the disease, if previous irrigations caused the disease to abate, only to recur after treatment was discontinued, there is a good prospect of effecting a permanent cure by the preturbinal method.

4. If the patient is an infant or a young child the intranasal is better than the external operation, unless there is an orbital complication or an external rupture. In the old, extensive radical operations are usually not indicated.

5. For female members of the better class, the preturbinal operation suffices, while for those of the working class the Denker or Caldwell-Luc operation is indicated.

6. Chronic invalids with serious internal disease need not take a general anæsthesia as the preturbinal operation under local anæsthesia is comparatively simple. Even should the more radical Denker operation be indicated, local anæsthesia is still practicable.

Otto M. Roth.

Hartzell, T. B., and Henrici, A. T.: *The Dental Path; Its Importance as an Avenue of Infection.* *Surg., Gynec. & Obst.*, 1916, xxii, 18.

The paper deals chiefly with the primary and secondary effects of the commonest known mouth organism, the streptococcus viridans, which constitutes one-half of the bacterial flora of tooth surfaces and may in actual numbers aggregate from three to three hundred million to the milligram of tooth scrapings. These organisms enter the circulation through the gum crevice, which has a very thin, meager, imperfect epithelial defense, as is shown by microphotographs of normal tissue. They enter also through pyorrhea pockets, and through the roots of dead teeth, thence through veins and perivascular lymphatics into the deeper structures and general circulation.

The authors emphasize the fact that the gingival crevice in the adult mouth is thirty inches in length. Ulceration of the gingival margins occurs by reason

of the extension into the crevice of the growth from the tooth's surface, which contains, in addition to enormous numbers of streptococci, great numbers of staphylococci. This ulceration soon breaks down the peridental membrane and deepens the gingival crevice. An average depth of one-eighth of an inch in gingival crevices means that the aggregate of ulcerating surface would be three and one-half square inches, and they state it is not at all uncommon to find an average depth of one-quarter of an inch of ulcerating gingival crevice which would mean an absorbing ulcerating surface of 7.5 square inches, which condition may exist without the patient's knowledge.

In an examination of more than 200 chronic dental granulomata, or the commonly so-called apical abscesses, they find the predominating organism to be the streptococcus viridans in every case. They show human lesions together with parallel experimental animal lesions of joints, blood-vessels, kidneys, heart-muscle, heart-valves, and striated muscle, produced by streptococcus viridans obtained from dental abscesses and pyorrhea pockets.

Earl, G.: *Focal Points of Infection with Special Reference to Root Abscesses.* *St. Paul M. J.*, 1915, xvii, 784.

The author relates the history of nine cases observed by him, in which the clinical connection existing between focal points of infection, more especially chronic alveolar abscesses, infected antra, tonsils, and ear passages, and remoter symptoms, as gastric disturbances and lesions, arthritis, cardiac inflammations, neuralgic tendencies, etc., is shown.

He concludes:

1. The causal relationship of focal points of infection to many heretofore doubtful symptom-complexes has been proved experimentally and clinically.

2. Focal points of infection should be kept in mind by every practitioner, no matter what his specialty.

3. The head seems to lead in harboring such focal points of infection.

4. Errors of diet and disturbances of internal secretions must be ruled out, as they may cause phenomena similar to focal points of infection.

5. Tonsils, when guilty, should be removed as soon as the very acute symptoms have subsided and should not be left until the rheumatic attack has run its course.

6. Root abscesses vary in symptoms caused, according to type and strain of infection, individual resistance, habits, and other complicating diseases.

7. In diseased teeth of the upper jaw, examination of the antrum should never be neglected.

8. Focal points of infection must be thoroughly eliminated, because the smallest area of absorption is sufficient to produce symptoms, and residual foci are more difficult to diagnose and treat.

H. A. Porter.

Sanford, A. H., and New, G. B.: The Relation of Amœbiæ to Pyorrhœa Alveolaris. *Surg., Gynec. & Obst.*, 1916, XLII, 77.

During the past 64 years many observers have reported the finding of amœbæ in human mouths. These have usually been considered non-pathogenic parasites until the reports of Smith and Barrett, and Bass and Johns, that these organisms are the cause of pyorrhœa alveolaris. Sanford and New have made examinations of patients with pyorrhœa during the present year. Cases in the first series [187] were graded according to the severity of the disease. It was found that in at least 14 per cent of apparently normal mouths, amœbæ could be demonstrated. In grade 1 pyorrhœa patients showed amœbæ in 43½ per cent of cases on first examination; grade 2, 62½ per cent; grade 3, 71½ per cent; grade 4, 80½ per cent. The authors suggest that the increase in percentage of cases is in direct proportion to the degree of pathologic change in the mouth suitable for their existence. In two small series of cases their results were negative in attempting to cure pyorrhœa with emetin.

Clinically, they could show no parallelism between *entamoeba buccalis* in the mouth and *entamoeba histolytica* in the stools of patients with chronic dysentery. A few experiments were performed in injecting pus containing amœbæ about the teeth of animals, also directly into the cæcum of cats, according to the method of Sellards and Bartjer. These were all negative, but the authors believe that before *entamoeba buccalis* is established as the cause of pyorrhœa alveolaris its pathogenicity must be demonstrated by animal experimentation.

Rhein, M. L.: Deep-Seated Alveolar Infections. *Surg., Gynec. & Obst.*, 1916, XLII, 33.

Frequent errors result in diagnosing alveolar abscesses as cases of pyorrhœa alveolaris.

The toxæmias resulting from dental granulomata where pus is not even present is far greater than the toxæmias resulting from pyorrhœal discharges.

Dental granulomata at the ends of roots of teeth

are mainly caused by incorrect dental operations.

The classic teaching of the dental school not to force a root filling through the foraminal opening has been proven to be wrong.

The great advance in the art of dentistry following this error in teaching, resulting in beautiful crowns and bridgework, has been a great factor in the increase in mortality of adults, due mainly to diseases of the heart, blood-vessels, kidneys, etc.

Extensive bacteriologic work and roentgenographic observation has shown positive evidence of reinfection starting at the crater-like entrances to the root canals wherever the filling material does not pass through the end of the root and seal these foraminal openings. Where, however, the pulp has been entirely removed and likewise every pathogenic area in the periapical region eradicated, and the canals hermetically sealed with gutta-percha so that the gutta-percha seals the entrance to the canals at the ends of the roots, it has been reasonably proven that no recurrence of infection takes place. The roentgenographic observation shows that the rarefied alveolar spaces are replaced by new structure.

The pathogenic state of the periapical region is eradicated by ionization.

The physician can soon learn to distinguish a correct root-filling by studying a roentgenograph of the completed work.

Prenn, J.: Abscess of the Tongue, with Report of Case. *Boston M. & S. J.*, 1916, CLXXV, 184.

Acute abscess of the tongue is rare. The great vascularity of the organ and the high resistance of the mouth structures tend to mitigate infection.

The diagnosis is not easily made early because of the indefinite symptoms such as headache, sore throat, etc. Later the markedly swollen, tender, tense, tongue with possibly fluctuation makes the diagnosis easy.

In the case in question the treatment consisted in longitudinal incision along the side of the tongue. About two teaspoonsful of pus were evacuated and prompt recovery followed.

J. H. SKILES.

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